DOCUMENT RESUME

ED 230 270 PS 013 387

AUTHOR Ntumi, Robert A.
TITLE Attitudes of Primary School Children in Ghana: Family and School Determinants of Children's Attitudes. International Development Research Centre Manuscript Reports.
INSTITUTION International Development Research Centre, Ottawa (Ontario).
REPORT NO IDRC-MR72e
PUB DATE Feb 83
NOTE 104p.; Filmed from best available copy.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Age Differences; Child Development; *Childhood Attitudes; *Educational Environment; Elementary Education; *Elementary School Students; *Family Environment; Foreign Countries; *Institutional Characteristics; Predictor Variables; Rural Urban Differences
IDENTIFIERS *Ghana

ABSTRACT

The nature and strength of home and school environmental characteristics relating to attitudes of children in Ghana are investigated. A total of 200 second, third, fourth, and sixth graders randomly selected from 10 schools serving urban and rural areas participated in the study. Two instruments were used to collect data: the values and attitudes interview schedule and the school resources index form. The former instrument was used to collect data on values and attitudinal outcomes of schooling as manifested in elementary schools, and the latter was used to create an inventory of resources available in the school for the purpose of constructing an index of school quality. Following multiple classification analysis and path analysis procedures, major results indicated that (1) elementary school children attain higher attitude levels than nonschool children of comparable socioeconomic status and age, (2) the longer children have been exposed to school influence the better their attitude scores, (3) the quality of physical structures of the child's school environment correlates with the child's attitude score, and (4) parental education and wealth have little direct effect on individual attitudes. (MP)

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Attitudes of Primary School Children in Ghana

Robert A. Ntumi

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IDRC-MR72e

ATTITUDES OF PRIMARY SCHOOL CHILDREN IN GHANA:

Family and school determinants of children's attitudes

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PREFACE

The research was made possible by grants from Anglophone West African Regional Educational Research Consortium (AWARERC), which is funded by Ford Foundation (U.S.A.) and International Development Research Centre (IDRC) in Ottawa, Canada.

The study looks at how Ghanaian primary school children acquire values and attitudes in two major environments, namely, the home and school. The report focussed on the contribution made by each environment as a block and also studied the components of each block. In reporting the results we were conscious of the need of young researchers who wish that research should report, in some detail, on methodology and preferences underlying the research. This is exemplified in chapter 3 which discusses the way in which we measured values and attitude constructs. The structure proposes a structural equation model which considers the theory which guided the study and a statistical approach. Our readers can therefore skip chapter 3 without missing much.

Robert A. Ntumi

Acknowledgements

Many people were involved in the study and I must begin with an expression of sincere gratitude to those Assistant Directors who allowed field officers in Kpandu and Ho Education Districts in Ghana, to assist in interviewing the children. I am grateful to Dr. R. Harbison, Dr. K. King, Dr. S. Sheffer, and Dr. S. Brown for the advice and encouragement they gave us to carry the project through. Many thanks are due to Dr. T. Williams, Mr. Ken Ross, and Dr. M. Rosier who read through the initial version of the study and offered valuable suggestions and especially Dr. Nelly Stromquist who edited this report. Chris Robinson helped us to get access to his Institution's computer. Finally my thanks to Mr. B. K. Osei, Miss Kuma Mildred and Mr. Aning-Gyamfi who are members of Curriculum Division, Ghana Education Service.

CHAPTER 1

THE STUDY

INTRODUCTION

In Ghana the school is a major educational reform agency. The Ghanaian people expect the school not only to equip the young with skills such as literacy and numeracy but also to teach them the 'right' attitudes to life: attitudes that are required for the community's successful drive toward the post-traditional era.

Many studies have indicated that, apart from the school, other factors shape the attitudes of children. Adult interaction with children in the home, the structural dimension of the home (for example, material possessions of the home), and parental education constitute the major determinants of such characteristics as work habits, attention to tasks, and qualities of need achievement. Some researchers would give greater weight to parental interaction with the child at home than economic level of the parents, their level of education, or other status characteristics (Majoribanks 1974, Williams 1974). All this means that the home and school are two powerful environments for the development of children's characteristics.

By coincidence, Ghana's New Structure and Content of Education Programme, 1974, emphasized child rearing environments and clearly outlined what the government expected from its schools. These are to:

1. develop in the child an appreciation of the need for change and adaptation;

2. help pupils appreciate the importance of co-operation and tolerance and the interdependence of people of different nations and cultures;

3. develop in pupils the habit of asking questions and a keenness to find things out for themselves;

4. provide opportunities that will predispose pupils to acquire the knowledge, skills, and prevocational experiences that will enable them to discover their aptitudes and potentialities and to develop a desire for further improvement;

5. help pupils appreciate the dignity of work and interdependence of all workers.

The government's acceptance of this mandate required changes in examination procedures. Unfortunately, educational evaluation in Ghana continues on a traditional basis at all pre-university levels; that is, assessment of students' academic achievement alone. The examinations tap mainly the acquisition of factual knowledge, placing a high premium on selection criteria at the expense of attitudes and value outcomes of schooling, so that very little attention seems to be given to those who fail to satisfy the selection criteria. Now that fresh policy demands have been made in the New Structure and Content of Education, it is left to the researcher to identify research areas from these policy statements.

This study, therefore, proposes to investigate the affective process as it relates to Ghanaian children in both the rural and urban

areas. It is belabouring the point that this aspect of education has been neglected in Ghana even though the literature on this topic is abundant in affluent societies.

The study reported here was carried out at the primary school level. The decision to conduct this study at that level was based on several factors. First, it is the only level of formal education that can be effectively enforced under the existing law of FREE AND COMPULSORY EDUCATION (1963). Secondly, for most children, grade six is terminal. In the 1977 - 78 school year only 40 per cent of the total grade six population was registered for the first year of the Middle School. For this reason, studying and understanding the process of how the school imparts values and attitudes at this level will allow us to make inferences about 7 to 11 year old boys and girls whose formal education terminates at this point. Thirdly, Bloom (1964) suggests that the home environment is most influential at the time of the child's greatest development, and the pre-school years are such a period. Though this is true, the stage of transition from primary to secondary schooling also poses problems for many children. Ideally, all levels should be studied, but the constraints of funds and personnel limit the scope. This study then explores how primary school children acquire the values and attitudes they bring to school and the extent to which these values and attitudes have been attained by the children; in other words, the influence of the home. Furthermore, the study investigates values and attitudes pupils bring to the secondary school, that is, the influence of the primary school. Since these environments are not mutually exclusive, it is necessary to establish causal links between the home, school, and attitude outcomes.

From what we know of our society and from statements on the role of schools in the process of inculcating values and attitudes we realise that our idea of "post-traditional man" and Inkeles and Smith's concept of the 'Modern man' have several factors in common. Inkeles and Smith, (1974) described such a man as having the following characteristics:

1. Openness to new experience.
2. Readiness for social change.
3. Growth of opinion.
4. Confidence in one's ability and the ability of the human being to achieve objectives.
5. Belief that other people and institutions can be relied upon to fulfil their obligations and responsibilities.
6. Valuing of technical skills.
7. Respect for the dignity of other people.
8. Positive attitude towards participation in public affairs.
9. Positive attitude toward work.

REVIEW OF EARLIER STUDIES

Our main objective in reviewing the literature on home and school as child-rearing environments is simply to identify those studies that have moved from predictive approaches to explanatory variables in their efforts to find out how environments affect schooling outcomes in the cognitive and affective areas. With this as background, we can then develop a rationale for using a causal model in a study of values and attitudes outcomes of schooling in Ghana.

Lerner (1958), Rogers (1969), and Dobb (1960) conceptualized

the modern person in terms of certain variables which they claimed were helpful in projecting educational aspirations and accomplishments. Kahl (1968) and especially Inkeles and Smith (1974) went further to formulate and tap his main characteristics. Instruments for this latter study formed the basis of the OM scale (Short Form). Even though the Inkeles and Smith study assumed cumulative growth of the modern man and drew attention to the rate of change over time in the acquisition of those attributes, the investigation concerned itself with adults, not school children. Our intention, however, is to study school children.

Environmental correlates of learning

Murray (1938) identified an environment according to the kinds of benefits or harm that it provided for individuals. He argued that individuals either avoided harmful environment or defended themselves against it. But when the environment had potential benefits, individuals approached it and interacted with it. Murray designated this as the "press of the environment". He further distinguished between alpha press of the environment (the press that actually exists) and the beta press, such as the individual's interpretation of the phenomenon that he perceives. Several studies have since been made to find out the direct relationship between measures of the alpha press of the family environment and children's cognitive performance and affective characteristics.

Along the lines of Murray's environmental press model, Bloom's discussion (1964) of stability and change in human characteristics assumes that an educational environment is influenced in part by the society in which it is located, with the individual placed in one of several distinct environmental situations. Bloom (1964) defined the

environmental situation as being physical and social, as well as intellectual, and considered that all these formed a network of environmental forces that impinged upon the individual and influenced him. He suggested that it was important to identify types of educational environments or sub-environments of press variables related to the characteristics of the individual.

Through research, Bloom's colleagues, the 'Chicago School' identified three such environmental situations as the home, school, and peer group. They went further and examined the environmental correlates of children's cognitive and affective measures. Among the 'Chicago School' Dave (1963) and Wolf (1964) operationalized some of these environmental press variables of the family and investigated the relationship between these and academic achievement and intelligence respectively.

Two studies (Keeves 1972, Majoribanks 1978b) are very comprehensive in scope and different in analytical approach in examining relations between family and school environments and cognitive and affective measures. Keeves investigated the environmental correlates of children's science and mathematics achievement and their attitudes towards science and mathematics. Five attitudinal and four process variables were looked at in the family environment schedule. Keeves (1972) split family environment into three powerful dimensions, namely, structural, attitudinal, and process dimensions. In general, the results showed that when the attitudinal and process variables were combined, they had moderate relations with mathematics and science and lower validities in relation to the attitude scores. A research on family and school environments and affective characteristics was conducted by Majoribanks (1977, 1978a, 1978b). In this study, he related family and school charac-

teristics to measures of children's school related affective characteristics. He not only obtained a measure of the intensity of exposure to the family environment, but also attempted to gain a measure of the cumulative nature of the environment during the interview schedule.

From the evidence of the studies cited in this report, there is little doubt that differences in the environmental press of the home and school can be identified and linked with children's differences in both cognitive and affective outcomes. The environmental press studies have, however, been criticised for failing to be explicit on whether they were simply predicting the variations in children's schooling outcomes or whether they were attempting also to explain why children varied in their traits. In our view this criticism is not entirely correct because Halpin and Croft (1970 : 90) and Reeves (1972 : 154) made the causal (explanatory) nature of their models explicit. The attribution was also apparent in the work of Wolf (1964), who considered environmental press in his model as causes of variation in children's abilities. The implications of the shift from prediction to causal explanation is of major interest to our study. If greater understanding is to be acquired of the causes of different levels of educational outcomes between different social groups, then environmental press characteristics should correspond with actual phenomena within family and school environments. This is to be preferred to predictive studies, since it is entirely possible that meaningless composite variables may predict achievement well and may be included in the model.

SIGNIFICANCE OF THE STUDY

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Previous investigations elsewhere have dealt with linkages between

the child's educational environments and its cognitive, connate, and affective traits. Efforts have also been made to identify the important dimensions of the family environments and to estimate their influence. Unfortunately very little work has been done in Ghana to assess home and school environments in terms of the more sophisticated environmental indices suggested by Bloom (1964).

Another important aspect of this study lies in the approaches adopted to assess the home and school environments and to consider their relationship to the outcomes of education. A critical period occurs when pupils are about to leave school and must decide whether to enter work or continue with full-time education. It is likely then that at this stage both school and home environments will have profound influence on the choices that are made. Causal relationships between powerful components of the home and school will therefore be of value to the parent, the teacher, and the administrator as they seek to provide the most favourable conditions for the growth and development of the children in their charge.

In conclusion, this investigation aims to point to some of the forces operating in the home and school, and to give some indication of their relative importance at the primary school level. This will pave the way for other studies at other levels.

RESEARCH DESIGN

Research Problem

We now formulate our basic research problem thus:

> To investigate the nature and strength of home and school environmental characteristics that relate to attitudes of children in Ghana.

Research Hypothesis

From the problem outlined above there are several hypotheses that could form the basis of a study into the educational environments of Ghanaian homes and schools:

Hypothesis 1 - Measures of structural variables of the home and school environments will be related to attitudinal outcomes of education:

(i) Material possessions of the home
(ii) Parental education
(iii) School resources or facilities
(iv) School management
(v) School location

Hypothesis 2 - Measures of the level of schooling achieved, that is, number of years of schooling*, will be related to measures of attitudinal outcomes.

Each hypothesis will be tested by decomposition of effects in a statistical model.

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*years of schooling and grade level are the same since at the elementary school level the government does not encourage children to repeat grades.

Research Plan

Our research plan requires a test of value and attitude change administered during a single academic year to groups of children enrolled in specified primary school grades. The same test will be administered also to groups of children of the same ages who have never been to school. Children who have never been to school may serve as control groups to those enrolled and will allow us to conclude with some confidence that any real differences between schoolers and non-schoolers may be attributed to the effects of schooling.

Variables

The variables chosen for this study can be grouped into the following categories:

a. Dependent Variables:

The dependent variables are the values and attitudes that the school is expected to produce in the children. They are the child's overall score on a scale of desired values and attitudes, and also the child's score on the subscales measuring specified components of the values and attitudes that are sought by the society, e.g., attitude toward females.

b. Independent Variables:

i) Amount of schooling, i.e., grade or number of years of exposure to schooling

ii) School resources

iii) School size

iv) School's religious tone

v) School's sex composition

vi) School location

c. Intervening Variables:

i) Age

ii) Material possessions (quasi socio-economic status)

iii) Urban/rural origin

iv) Sex

v) Parental education

The fundamental assumption that school experience produces value and attitude development implies that the more one is exposed to learning experience, the more he internalizes the content of the experience. To test this assumption, the analysis of the impact of schooling on the acquisition of values and attitudes must also take into account the intensity of schooling. The student's grade was assumed to reflect the level and intensity of schooling.

School characteristics that were likely to have significant impact on the child's acquisition of values and attitudes were considered as independent variables. We assumed that the extent to which the home environment differed from the school environment would have a certain effect on the development of the child. Also, the extent to which one school environment differed from the environment of another school was expected to result in a differential impact of schools on the acquisition of values and attitudes. Quality of building, library, recreational, and toilet facilities were used as indicators to measure school resources.

Additional independent variables were the school's size, sex composition, and location. The size of the school was expected to affect the acquisition of values and attitudes because the degree of interaction within small schools was considered to be stronger than in large schools and thus likely to produce a more integrated environment.

Many of the schools in the study were operated by religious organizations of different faiths, which used the schools to make converts for their respective faiths. The school's sex composition also had its unique contributions. One of the correlates of learning was location of school; differences in location implied existence of differences in demographic and socio-economic parameters of the school tone.

We investigated another set of variables which mediated the impact of the independent variables on the learning values. These were the student's quasi socio-economic status, urban-rural origin, and religion. Maturation or age we regarded as not dependent on formal education and training. Age was seen rather as the natural process which helped the efficacy of educational strategies. For the same reasons we included quasi socio-economic status (QSES), sex, urban-rural origin and religion. QSES was operationalized in the same way we operationalized school resources; that is, by taking an inventory of items suggestive of the relative affluence of the child's home, which enabled us to construct an index of QSES. We used school resources and QSES indices to estimate the extent to which the child's home differed from the school in terms of environmental quality.

Instrumentation and scale development 19

Two instruments were administered: the values and attitudes

interview schedule and the school resources index form. The former was used to collect data on values and attitudinal outcomes of schooling as manifested in primary schools, as well as among non-schoolers. The school resources index was used to take inventory of the resources available in the school for the purpose of constructing an index of school quality, which was one of the independent or predictor variables. For each of the six blocks of indentified variables, a summary measure was formed to portray the underlying property of the block.

The creation of aggregate indicators of unobserved variables from many observed measures presents several problems. Some of the issues associated with composite variable formation have been investigated by Rosier (1978), Reeves (1971), and Williams (1974). Rosier derived weights from multiple regression analysis. Reeves used rosettes as carriers of regression. The latter approach involved two stages of scale refinement. During the first stage, items associated with the criterion were examined with principal component procedures in order to select items that discriminated effectively and were also consistent within the set. In step two, standardized regression weights were determined and used to calculate scores on the variable that would be strongly related to the criterion measures when allowance had been made for other variables in the set. Thus the weights or rosettes derived to carry the regression relationships (for instance, five measures on a given block) would be computed as follows:

$$\text{Rn} = b_1 A_1 + b_2 A_2 + b_3 A_3 + b_4 A_4 + b_5 A_5$$

where:

b = weight (standardized)

A = item value

Unfortunately, premature collapsing on some response categories of the children put constraints on the use of the two techniques described above in forming composite variables for this study. In such circumstances, we used a simple approach in constructing our composite variables. Let us take them in order. Regarding measures for the overall attitude scale and eight subscales, we adopted a simple additive index in which all items were added together to create the attitude index. This means that each of the contributing items was identically coded to contain the same number of categories. A similar additive index was obtained for parental education with an ordinal level of measurement. In regard to Material Possessions of the Home and School Structural Characteristics, each variable was divided by the number of categories it contained. Religion and School Management fall under the nominal level of measurement and therefore a dummy variable coding procedure was used. Weighting presented no serious problems. It entailed scoring alternative answers to each question in such a way that 'desirable' and 'undesirable' attitudes were assigned 1 and 2, respectively. The question of introducing a precise cutting point to a scale conceived as representing a continum can hardly be overlooked. But as I stated earlier, information was too quickly collapsed and this could have presented problems for scale reliability.

Scale Reliability and Validity

Before the start of this study concern was expressed about using the same scale for two distinct age groups (school children and adults). Critics have also pointed out that since the scale was used about eight years ago, and we are now in a period of rapid social change, scale reliability may be affected.

There is also the problem of validity. Attitudes are abstractions from people's responses. If social values fluctuate, then the constructs we are trying to tap are unstable and the scales may measure different constructs.

In view of these problems, principal component analyses without iteration and varimax rotations were used. From the analyses we realised that some of the subscales should be refined to take into account suggestions made elsewhere in this report. Details of this analysis are reported in Appendix 2.

Sampling Procedures

A total of 200 school children were interviewed. Forty-five non-schoolers of ages comparable to those of the school children were also interviewed. The 200 school children were drawn from 10 schools selected from urban and rural areas. The criteria applied in stratifying schools for the purpose of selection showed how school location, school size, sex composition of school children, and school management authority were operationalized to ensure that each specified category was adequately represented in the sample. The total sample of school children consisted of 25 children selected at random from each of the four grades (2, 3, 4 and 6) included in the sample. Since all the schools were mixed, a proportionate number of boys and girls were randomly selected from each class. In the case of non-schoolers, children who were bringing 'foodstuff' from villages to sell in the market, were selected and interviewed. Their ages were comparable to those of the school children.

Data Analysis

A variety of approaches was utilized in analyzing the data. We started with rather simple tabulations, such as frequency distributions, descriptive statistics, and cross-tabulations.

Closer examination of discerned relationships central to the main study involved multiple classification analysis using some of the intervening variables as covariates.

We also drew upon path analyses techniques to estimate the simultaneous relative power of variables in accounting for attitudinal and value outcome variance.

Approach

The strategy of the analyses was based on our conceptual framework of the educational environment of the home, school, and peer group. Generally, Multiple Classification Analysis (MCA) and path analysis procedures were employed to examine the criterion variable and the relationships among blocks of variables. These approaches were used because we argued that the research study was the type in which prior performance variables served as antecedents to predictor and criterion variables and exerted influence on both. Unless we can convincingly argue that no correlations exist between prior performance and predictor variables, analysis of variance procedures raise serious analytical problems. However, by the use of this alternative statistical technique as described in this report, meaningful results were obtained and showed that the techniques were appropriate and necessary for the effective examination of the complex relationships that existed among the variables. Since the

results of this pilot study point to a number of questions that should legitimately form the subject of future investigation of our society, the techniques used in this study should be appropriate.

CHAPTER 2

OVERALL SCHOOL EFFECTS

INTRODUCTION AND DESCRIPTIVE STATISTICS

In the literature review we made the fundamental assumption that school environments provide school children with some aspects of learning experiences that traditional societies lack, and these experiences influence the child to acquire desirable attitudes. On this basis, the objective of the various types of analysis in this chapter is to ascertain whether it is true that school environments perform the function of producing desirable attitudes in children to a significant level. If schools do provide facilities that help children to acquire desirable attitudes, then children who have passed through the school system should demonstrate higher attitudinal qualities than those who have not had this opportunity; also, the longer a child is exposed to school influence, the better his attitudinal score. To establish this assumption, we compared the mean attitude scores of cross-sectional data for non-schoolers, and also for grades 1, 2, 4 and 6. If each additional year of schooling was accompanied by a substantial gain in scores, then we would attribute this to an overall school effect.

At another level of analysis, the mean scale scores are presented in graphs shown by grade for each subscale, and also for the total attitude scale, to enable us to compare the scores for non-schoolers and schoolers. Later in this and subsequent chapters, much more thorough analyses are given. We obtained simple zero-order intercorrelations and regression weights as measures of the influence of one variable on another

in a one-way causal model in order to measure the extent of the association between school experiences and the presence of desirable attitudes.

The cross-sectional data are presented in table 2.1 below. The mean scale scores are reported for each of the grades sampled. In order to test for the level of significance of the differences observed among the mean scores for different grades, we adopted the null hypothesis that subscales with significant levels of .10 to .001 are acceptable. Significant levels greater than .10 allow too much risk, and significant levels of less than .001 are considered too conservative. Any subscale with a significance level greater than .10 was deleted from further analysis. We gave, however, no lower bound for deletion, especially when the ETA squared value of a subscale is about ten percent, indicating the amount of variance being explained by it. Following our coding convention, lower mean scores indicated better performance. The significance level of the overall attitude scale is below the .001 level and this may be attributed to the influence of scale outliers.

Table 2.1 SUMMARY OF MEANS FOR THE NINE SUBSCALES AND FOR THE OVERALL ATTITUDE SCALE

SUBSCALES	GRADE					Significance level	ETA^2
	Non-Schoolers	2	3	4	6		
OPENNESS TO NEW EXPERIENCES	1.375	1.306	1.303	1.216	1.236	.06	.06
READINESS FOR SOCIAL CHANGE	1.578	1.459	1.475	1.412	1.394	.001	.10
OPINION GROWTH	1.503	1.434	1.533	1.620	1.545	.001	.07

SUBSCALES	GRADE					Signi-ficance level	ETA^2
	Non-Schoolers	2	3	4	6		
CONFIDENCE	1.254	1.298	1.306	1.183	1.247	.02	.06
BELIEF AND TRUST	1.304	1.301	1.329	1.186	1.215	.001	.10
RESPECT FOR DIGNITY	1.479	1.401	1.394	1.366	1.329	.005	.08
ATTITUDE TO WORK	1.370	1.327	1.331	1.238	1.259	.001	.08
VALUE OF TECH. SKILLS	1.080	1.126	1.115	1.040	1.040	.02	.05
PARTICIPATION	1.514	1.558	1.597	1.566	1.538	.3	.01
OVERALL ATTITUDE	1.368	1.357	1.375	1.314	1.307	-	-

SCALE GRAPHS

When examining tables and figures in this chapter, care must be taken to remember the coding convention we used to score the variables. A high positive score on each attitude scale was assigned a low rating and conversely a lower mean score meant better performance.

Openness to new experience

A six-item index for the first subscale was administered to 245 pupils. The scale was meant to determine how pupils would respond to opportunities for new experiences, such as making friends with a new student in their school or travelling outside their immediate locality. The predictions of such predispositions go beyond the simple context in

which the questions were asked. It might embrace willingness to use, e.g., a new drug or new methods of farming. The results showed that on the whole pupils were willing to make new friends; and few of them preferred staying in their present school to moving to a far distant school. See Figure 2.1.

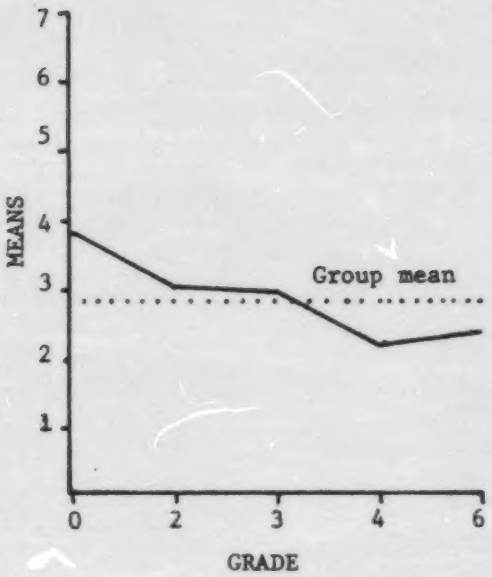

Fig. 2.1: Openness to new experiences.

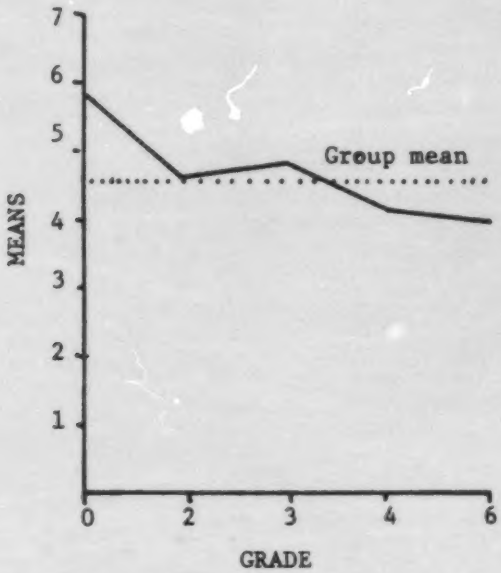

Fig. 2.2: Readiness for social change.

On the horizontal axis, the 0 refers to non-schoolers, the 2 to grade 2, 3 to grade 3, etc.

As the graph in figure 2.1 dipped down to the right especially between grades 3 and 4, it indicated a considerable shift in response from grade 2 to grades 3 and 4, thus demonstrating the curiosity and desire of upper primary classes to meet and probably understand different people.

Readiness for social change

Group two subscale items, seven in number, referred to pupils' acceptance of changes in social organizations; for example, whether they considered it correct for people in authority to share or delegate authority. This was measured by asking questions framed around women's and children's traditional roles in the home. Some questions dealt with general mobility across different language groups in Ghana. Figure 2.2 illustrate the results. It shows a definite response pattern. The number of years pupils spent in school influenced their thinking. Pupils in the higher classes felt that both parents should share domestic duties and affirmed that equality of men and women was good. They also showed clear acceptance of scientific treatment of common diseases, which meant rejection of sorcery.

Growth of opinion

The growth in opinion subscale sought to discover the extent to which the pupil's awareness of diversity of opinions and attitudes had increased beyond a general rejection of variant perceptions in others. The scale was keyed to elements of tolerance and differences of opinion, while the distractors were based on autocratic and hierarchical ways of evaluating opinion. These ideas were woven into questions that requested the pupil to tell the interviewer whether he would automatically accept the ideas of his peers and those above him in the power structure and reject the opinions of those below him. The table 2.2 and Figure 2.3 show the response pattern by grade.

Table 2.2 MEANS AND STANDARD DEVIATIONS FOR GROWTH IN OPINION SUBSCALE

Class	Mean	Standard Deviation
Non-schoolers	1.50	0.26
Grade 2	1.44	0.20
Grade 3	1.53	0.14
Grade 4	1.62	0.20
Grade 6	1.55	0.21

The results were unexpected, even though this is a fair reflection of general classroom atmosphere in Ghana. The figures tell us that younger pupils in grades 2 and 3 show greater flexibility as to whose opinion should be respected and accepted than do the higher grades, which tend to conform and accept orders from above readily. We take consolation, however, in the fact that the sample under study was small and restricted to one region. This prevents the generalization of results to other regions. Nevertheless, the present results show that lower primary grades and even non-schoolers have a more independent attitude than upper primary grades.

Belief in People and Institutions

The trust and belief scale was investigated as Attitude 5. The extent to which pupils trusted traditional and government institutions — especially institutions that keep peace and order — were important to

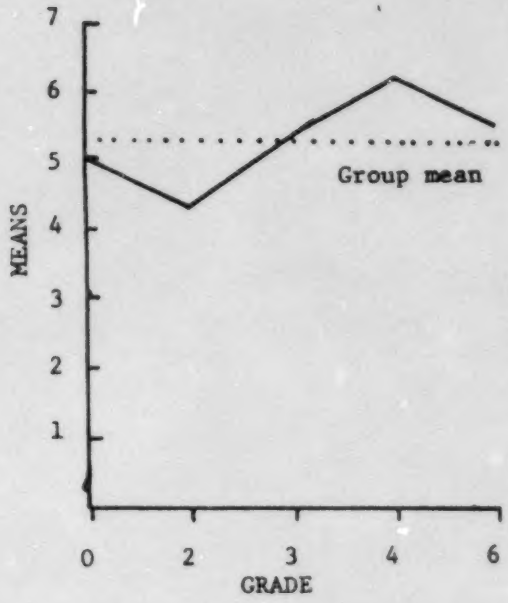

Fig. 2.3: Growth of opinion.

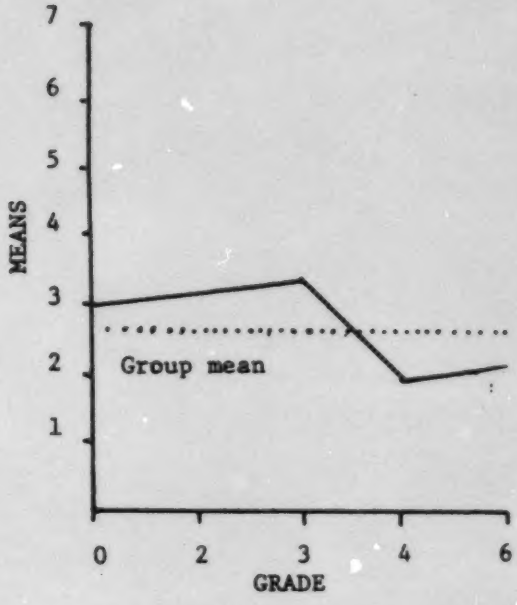

Fig. 2.4: Belief in people and in institutions.

the study. We examined a seven-item index that covered, among other things, faith and lack of faith in their peer group and in the police. We are aware that students begin to show interest in school administration at the secondary school level. We have in recent years witnessed an increase in the incidence of confrontation between secondary school students and police. What might appear to be secondary school and home effect could be present also at the primary school level. The results showed that 72 per cent of the respondents did not trust the police; about 60 per cent would, however, trust their fathers. The overall trend indi-

school declining public trust shown by the upper grades of the primary school. The path analysis in Chapter 3 traced two paths leading from the Material Possessions of the home and Parental Education variables to this scale. The strengths of the paths were - .10 and .12 for Material Possessions and Parental Education, respectively. This meant that pupils who came from relatively affluent but uneducated homes tended to be low on the scale. All this points to the need to study student behaviour and most importantly to investigate how the interest of students in school administration and government is related to educational attainment and to the quality of school attended. The investigation should look carefully at the rate of declining trust, if any. See Figure 2.4.

Confidence in Oneself and Others

Nine measures dealt with the pupil's confidence in himself to influence and change his physical environment to his advantage. The results are shown in Figure 2.5. Questions embraced a scientific explanation for natural events (e.g. germination, causes of thunder) and covered also concepts such as a kleptomaniac's will-power to stop his habit and the ability of a man to achieve a predetermined goal. As you may readily recognize from the graph, the results showed that grade level, to a large measure, seemed to have influenced achievement scores in this attitude scale. In other words, personal dimension as defined by the scale had a strong and positive impact on the score, with grade mean decreasing steadily from 1.47 for the non-schooling group through grade 2 to a statistically significant mean of 1.33 for class 6. (Refer to table 2.3, Attitude 4.) Given the findings outlined here, a logical flow of the

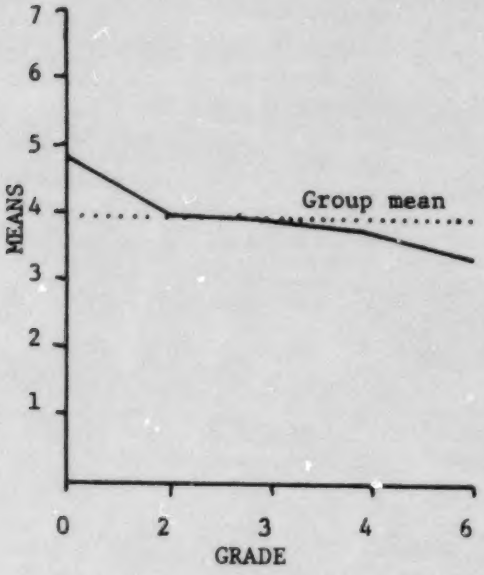

Fig. 2.5: Confidence in oneself and others.

study from this initial position would have been to explore those aspects of the classroom (teacher attitude, equipment, task orientation, etc.) that influenced pupils' confidence. A causal model in which paths lead from these variables to the criterion model would have generated much interest.

Attitude toward Work and Technical Skills

Finally, two themes, attitudes toward work commitment and technical skills were dealt with. The two themes are closely interrelated because they both involve manipulative skills at the behavioural level. Thus a pupil described as having the right attitude toward work must be observed to be interested in working. After a pupil had declared his position on each scale during the interview he was further probed for

information and evidence regarding his behaviour. Pupils' performance on the two scales are shown by graphs. Figure 2.7 and 2.8 illustrated that each step up the education ladder brought with it a fairly regular and substantial increment in score which could be described as good attitudes toward work and technical skills. We hesitate to make any further comments

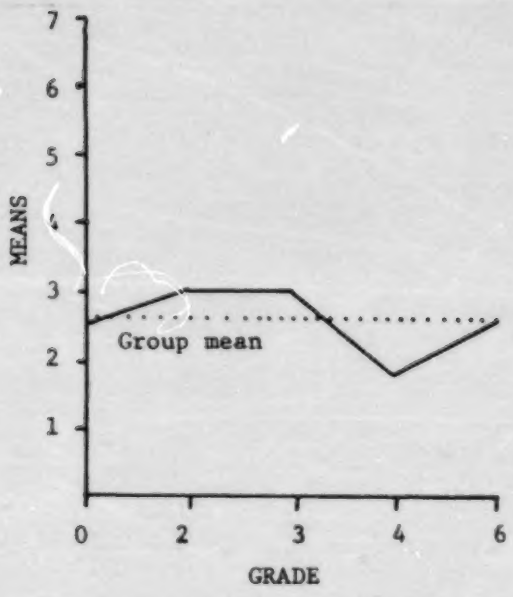

Fig. 2.7: Attitude toward work.

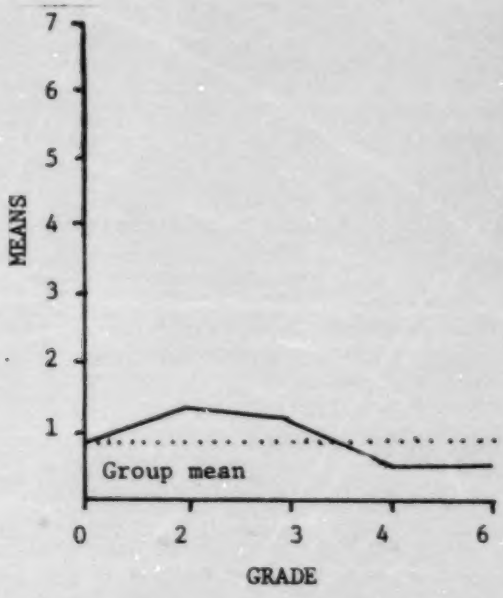

Fig. 2.8: Valuing of technical skills.

on the two scales because the theoretical bases for interpreting the attitude of a pupil low on the scale fail to explain variances in terms of learning theories.

Table 2.3 SUMMARY OF MEANS FOR SUBSCALES AND OVERALL SCALE

Scales	Means				
	Non-Schoolers	Grade 2	Grade 3	Grade 4	Grade 6
OPENNESS	1.375	1.306	1.303	1.216	1.236
READINESS	1.578	1.459	1.475	1.412	1.394
OPINION	1.503	1.434	1.533*	1.620	1.545
CONFIDENCE	1.479	1.401	1.394	1.366	1.329
BELIEF	1.304	1.301	1.329	1.186	1.215
RESPECT	1.254	1.298	1.306	1.183	1.247
WORK	1.370	1.327	1.331	1.238	1.259
TECHNICAL	1.080	1.126	1.115	1.040	1.040
OVERALL ATTITUDE	1.368	1.357	1.375	1.314	1.307

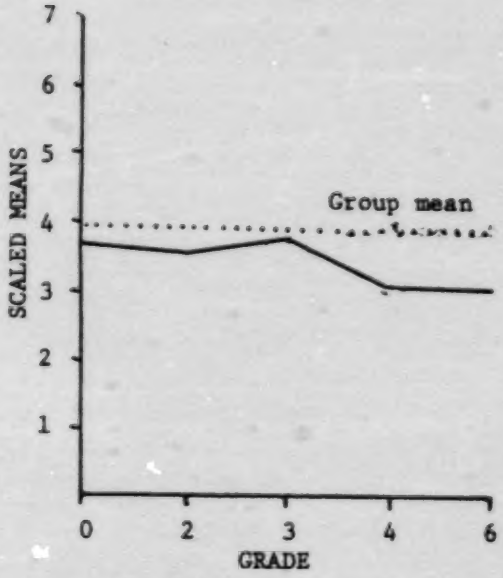

Fig. 2.9: Overall school influence.

Figure 2.9 illustrates clearly how years of schooling influenced class performance and, in fact, shows that a definite change occurs between grades 3 and 4. Even though no definite interpretation at this stage can be made, the general indication is that certain aspects of school environments foster desirable attitude formation. We hesitate to be specific here because the results could be attributed to maturity, which is one of the subjects for investigation in the following section.

MULTIPLE CLASSIFICATION PROCEDURES

Another approach to these results is to use multiple classification analysis (MCA). One of our initial predictions in the study was that the length of exposure to education would have a great impact on attitude formation and attitude change. To further verify this, the issue of maturation as competing with other school factors in children's attitude formation is examined here by using MCA. Since both the non-school and school children live in the same geographical area, we obtained a sample of non-school children whose mean age and family socio-economic status were to a large measure equivalent to the age and socio-economic status of the school children sample. The non-school sample was made of 45 children selected on market days in the villages where the schools were located. The instrument was administered to each child individually and in private.

Among the school factors the focus was on school quality. What is implied here is that good structural facilities influence the child's attitude in such a manner the child's attitude score becomes higher with each successive year in school, and that children who have never been

to school and therefore live in poorer environments should have lower attitude score. The procedure for analysing this situation is simple. Given that both home and school environments operate in a complex manner, it is desirable to know the net effect of each variable when differences in one variable are removed or controlled. Since our criterion variable was measured on both school and non-school pupils **and we wish to hold age** constant, regard measures taken on non-schoolers as base line, and then examine the effect of year of schooling, maturity and non-schooling have become two important aspects of the analysis and we must demonstrate that they do not seriously cast doubt on the pattern shown in Table 2.1.

The data obtained in this study were a mixture of ordinal, nominal as well as interval predictors in which the last one was obtained as class intervals. We explained elsewhere in the study that the criterion scores were made up of additive components for each category of the predictor variables. Survey data in general have inter-correlated predictors, so that effects noticed during analysis of data could be contributed by a predictor variable's correlation with other predictors. Because of this, the usual analysis of variance procedure seem to enable us estimate parameters of this analysis. Multiple Classification Analysis (MCA) satisfies our design. **Andreas et al.**(1973) suggested the following equation for the model:

$$Y = M + a_1 + b_2 + \ldots + e$$

where

Y = the score on the dependent variable

M = grand mean on the dependent variable

a_1 = the effect of category 1 of predictor 'a'

b_2 = the effect of category 2 on predictor 'b'

e = error term.

In this approach, the main-effect coefficients are expressed as deviations from the grand mean, similar to the least squares procedures in which the constant term is restricted to the grand mean. The MCA model fits a set of coefficients to obtain measures for a_1 b_2 in the model. By this approach we are able to show the effects of any explanatory variable both before and after taking into account the effects of all other predictors. The fit of the model as a whole can be judged by the proportion of variance in the criterion explained by the predictors.

With these explanations as background we set to examine the pattern of changes in the effects of years of schooling as we control for age. The results are presented in Table 2.4.

Table 2.4 MULTIPLE CLASSIFICATION ANALYSIS

GRADE	N	UNADJUSTED	ADJUSTED	GRAND MEAN (1.39) PLUS ETA
		ETA	BETA	
Non-schoolers	40	.06	.06	1.45
Grade 2	54	.03	.03	1.42
Grade 3	47	.03	.03	1.42
Grade 4	50	-.06	-.06	1.33
Grade 6	54	-.05	-.04	1.34
Eta Value		.47	.45	
Multiple R^2		.23		
Multiple R		.48		

Table 2.4 shows effects by grade. First, connected with the set of unadjusted effects for years of schooling (reported at the bottom of column 3) is an eta value of .47. Eta is simply the correlation ratio and eta squared indicates the proportion of variance in the attitude scale explained by the factors in the analysis; in this case, age and years of schooling. Second, associated with the adjusted category effects of years of schooling on attitude is a partial correlation ratio of .45. This is shown under the column labelled beta. Beta can be regarded as standardized regression coefficient.

A comparison between the unadjusted eta and the partial beta yielded a valuable result. The squared 'betas' decreased from .221 to .203, a difference of an insignificant value of .018 as we controlled for age. That is, age contributed about 2 per cent of the variance. This shows that while a very small part of the association between attitude and years of schooling is due to maturity of pupils, education and other factors not yet partialled out accounted for nearly all the variance. Finally, the R^2 of .23 shows that 23 per cent of the variation in the attitude scale is explained by the additive effects of all factors including the covariate, and column 5 headed 'grand mean plus eta' gives a simple pattern of the results. Recalling the coding procedure, we now have three distinct groups upper primary, lower primary and non-schoolers, in that order of merit. This demonstrates the intensity of school exposure, upon student attitudes.

SUMMARY

At the various stages of the analyses in this chapter the

emphasis was on the general quality of the school environment, as compared with what we may term traditional influences such as African religion. The explanatory variables working as a unitary force on the subscales and also on the composition scale of the criterion were explored. We have produced some evidence to show that the child's school environment can have positive influence and that the school's influence on children become greater with each successive year in school. By comparing school and non-school results, we realized that school children demonstrate much more desirable attitude than non-schoolers.

CHAPTER 3

CAUSAL INTERPRETATIONS

INTRODUCTION

It has been established in the previous chapters that there is a positive association between formal schooling and attitudinal values in children. In the preliminary analyses, including MCA, the school was regarded as a single unit, so that school effects were shown as net of other competing forces. However, the techniques used could not enable us to delineate the special features of the school that influenced attitudes. Furthermore, the results we obtained did not go far enough to explain fully the relationship between the two environmental situations (home and school) and the criterion variable.

Some approaches have been developed in recent studies for dealing with this kind of problem. One of these, the causal model, is used here to explain the linkages between the home, the school and the criterion. The purpose of this chapter, then, is to investigate selected aspects of the school environment which we think influence attitudes and go further to examine the relationship between these and home factors, since previous studies have suggested that home factors have direct effects on attitude.

THE INFLUENCE OF THE ENVIRONMENT

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Keeves (1972) considered home and school as dimensions

of the educational environment. They further suggested that the school dimensions constituted forces that operated upon the child to bring about changes associated with experiences in the home, the school and the child's class or peer group as social organizations.

Williams (1976) presented a modified model and indicated that environmental dimension or press models (such as that of Dave, 1963) could be flawed on the grounds that they 1) omitted parental abilities from the models, and 2) focussed the analyses around the proportion of variance accounted for R^2. He said:

> (i) Family environment influence on cognitive development must be seen within the context of a model that allows for the influence of parental abilities on children's directly, and indirectly via the social and economic attainments of parents, via family environment, and through the socio-economic status - family environment linkage itself ... parental abilities seem to be clear-cut antecedents to all variables within such models.
>
> (ii) In this sense it is somewhat paradoxical to find an elaborate multidimensional theoretical model operationalized empirically by a single statistic measuring the combined effect of the several environmental dimensions.

This survey does not intend to examine the merits and demerits of the two aspects of the model here but to show that several forces interplay in a rather complex way. Any efforts to use the causal model to explain how these forces influence children's cognitive and attitude learning should bear in mind the issues of nature and nurture. These are discussed in the following paragraphs.

Home Environment

Two types of measures of the home environment were employed in the study: measures concerned with material possessions of the home and parental education. We gathered information from the children on a number of related socio-cultural aspects of the home. But problems of multicollinearity in regression analysis forced us to stick to three variables: father's education, mother's education, and number of books in the home which were in turn combined to form a composite index to assess the socio-cultural level of the home.

The second type of measures of home environment dealt specifically with some economic items of the home and not parental behaviour. We feel that these play important roles in living conditions. Vernon's (1969) cross-cultural study on the relationship between environment and ability used eight categories which included housing, equipment in the home and books. The Plowden Report (1967) subjected 80 variables to factor analysis and identified 14 variables including physical amenities and literacy of the home. The two studies were significant in many respects but not clear in working out the linkages among the dimensions. We have included items like the refrigerator, gas/electric cooker, and sanitary facilities to trace their path to the criterion. We believe that as the home atmosphere varies for the growing child so varies the stimuli they provide for learning attitudes and values.

School Environment 43

There are several dimensions to the concept of school environment, such as learning environment, classroom behaviour of the teacher,

teacher's attitude towards teaching, and physical setting of the school. The study was concerned with the physical environment, organizational structure of schools, and classroom characteristics. These three were selected simply because primary school buildings and school equipment in Ghana are in deplorable condition and we wish to draw attention to them. We think the presence or absence of such facilities as school toilets, desks, recreational areas, playground, equipment, textbooks and library may have a major role in attitude formation and change. After several visits to schools in the sample, we prepared a school resource index form containing 11 items. This form was completed by a trained interviewer for each school and according to a precoded scheme. Items were combined to reflect the underlying property of each variable. The resulting values were recorded for each child depending on which school he was associated with.

By school management, we mean the organization responsible for administering the schools. The government of Ghana, for several years, took over the administration of all first cycle schools in the public system and shared financing of these schools with local councils. Government, however, reconsidered its position recently and came out with a new policy allowing religious bodies to build and administer their schools. Since then, religious bodies have funded and managed schools. It was thought interesting to find out the impact of schools run by local councils and religious bodies on student attitudes.

Classroom/peer group

Researchers such as Bronfembrenner et al. (1965) and Holsinger

(1972) have reported results indicating the socialization influence of the classroom. The former found that a teacher's behaviour towards his pupil indicated a higher relation to his values than the pupil's report of his parents. The child's classroom behaviour, his attitude to his work and his attitude of his society were the indicators Helsinger combined into a single summary measure of classroom quality and tried to estimate the strength of the relationship between attitude and classroom environment. We administered Inkeles and Smith's scale (Short Form 2) containing 13 items to teachers.

Most urban schools in the experiment practised team teaching. Thus it was difficult to associate a particular teacher with a class during coding sessions. We were left with one alternative, that is, we used peer group as a measure of the contention that years of schooling increases the intensity of school exposure to school learning. We now turn to see how these variables related in a causal sequence. The variables are reported in Table 3.1.

TABLE 3.1 SUMMARY OF VARIABLES IN THE MODEL

Variable name	Description
1. Parental Education	Ordinal measure based on father's and mother's levels of education respectively. 4 represents university education, 3 diploma 2 elementary school, 1 no formal education. These were coded from children's interview response sheets. (ii) Number of books in the home.

Variable name	Description
2. Material possessions in the home	The interviewer checked which of 11 items the respondent reported to have at home. A code of '1' represents more than 5 of these items and '2' from 0-5 items.
3. Physical structure of the school/school characteristics	(i) School sanitation - three-point scale. (ii) School building - nine-point scale. (iii) Playing grounds - two-point scale. (iv) Recreational equipment - six-point scale.
4. School location	This referred to whether a school was located in a rural or urban environment. Rural environment is defined by the following: (i) Number of times the village received national newspapers a week. (ii) Presence of electricity. (iii) Presence of pipe-borne water. (iv) Presence of health clinic. (v) Number of lorries that come to the place daily. (vi) Presence of a cinema house.
5. School management/ Proprietorship	3 By a church 2 By local authority 1 Arabic school type (These were recorded using dummies for each child.)
6. Classroom	(i) Background influence of teachers such as - age, sex, professional and academic qualifications, and experience. These were precoded on the questionnaire. (ii) A thirteen-item attitude scale based on Inkeles' modernity scale, Short Form 2. These were coded with '1' for desirable attitudes and '2' for undesirable attitudes.

Variable name	Description
7. Sex	Sex was coded: 1 for female 0 for male
8. Religion	3 for Christianity 2 for African religion 1 for Muslim religion

DESCRIPTION AND IDENTIFICATION OF PATHS

Consistent with the intention of taking into account home and school environments, a chain model was designed. To do this effectively, five blocks of explanatory variables were formed and included in the study. For each block of variables, a single composite variable was formed, and the relationships between the blocks and the criterion were described in terms of a causal sequence. The whole procedure was a long process of constructing variables which would assist in the explanation of variance in the criterion, provided we succeeded in organizing these variable into logical blocks. Two blocks of factors described family environments of the child in terms of parental education and material possessions of the home. Both blocks constituted the structural dimension of the home. The third, fourth, and fifth blocks of variables reflected school environments. These were management of school proprietorship, physical facilities in the school, and classroom or peer group.

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In addition to the five composite blocks of variables, sex, religion and location of school were used in the estimation of the

magnitude of the relationships between the components of the causal model.

One of the main constraints of the causal model is the concern for sequence (Figure 3.1). Temporal sequence determines how the variables enter the causal model. Accordingly the variables Parental Education and Material Possessions of the home come first in this sequence. Since no arrows lead to both variables any variabilities in them may, for this reason, be attributed to influences outside the causal model. Variables that are not influenced by other variables in the model are said to be exogenous. Unidimensional lines with arrow heads flowing from variables (X_1) and (X_2) to variables School Management type, School Structural Facilities and Classroom Characteristics depict the second set of variables in the sequence. The final variable (X_7) is in turn influenced by all variables preceding it. The arrowheads act like valves to demonstrate that variables cannot perform two functions of being the cause and effect of other variables. Thus the variables (X_3) to (X_7) are called endogenous, that is, they are influenced by other antecedent variables and in the circumstances their variability can be explained, to some extent, by both exogenous and other endogenous variables in the model. It is also possible that some variables may play mediating roles and will therefore influence other variables indirectly. No survey studies have ever claimed to explain one hundred per cent variance. All unexplained variances or error equations are shown by (u), (m), (v), and (w). We assume that the errors correlate neither with themselves nor with independent and dependent variables. Where the model shows bidirectional arrows they are meant to indicate non-causal correlations between variables.

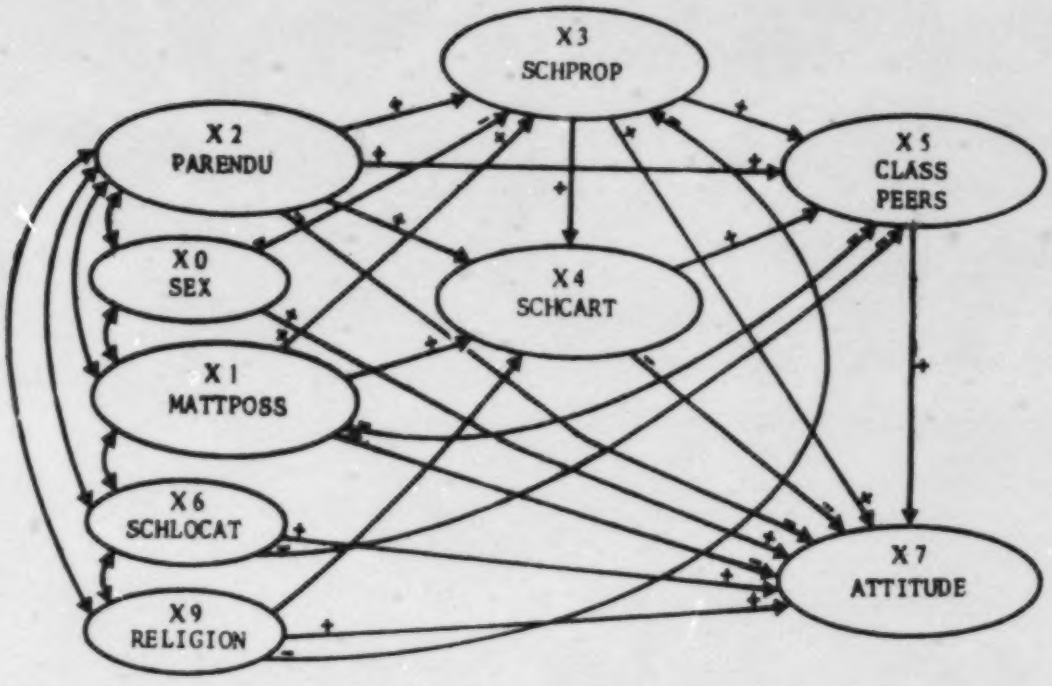

Figure 3.1 HYPOTHESIZED PATHS FROM HOME ENVIRONMENT THROUGH SCHOOL TO ATTITUDE

Figure 3.1 represents paths of influence from home environment through school setting and subsequent linkages leading finally to the criterion. The lines show the causal linkages we intend to investigate, Examining the diagram from left to right we see that home environment affects school management, structural characteristics of the school and it also influences classroom or peer groups as well as the criterion. There are two different sets of independent variables. The first set has two separate but related components and embraces those variables that describe the home environment. One of these two components consists of four levels of parental education, the measures of which were later on combined into an index. The other component contains measures on material possessions of the home. Our second set

of variables describes school management by type (church or local authority) structural characteristics of the school and classroom or peer group. All these are taken to compete with home environment variables in forming and changing children's attitude.

Since several measures were taken on each of the components, single indices were formed from the many observed measures relating to them and by this we formed six blocks of variables, namely: parental education, material possessions of the home, school management, school structural characteristics, classroom or peer group and the criterion that is, attitude scale. In addition to these we took age, sex and school location as given and associated with our variables. We also added religion because it has much to do with the value system of the Ghanaian.

The hypothesized paths traced in figure 3.1 carry negative and positive signs based on assumptions described here. Children of educated parents in general are highly motivated and have greater ability than others. Given parental education and material wealth of the home, parents may look for good schools with regard to management, curriculum and physical environment. They may even obtain special student services such as enrichment lessons for them. Children from poor homes tend to be less motivated and therefore less able, unless they are provided efficient teachers and professional help such as remedial teaching. In this way two measures —— parental education and material possesions of the home —— serve as measures of both parental and community preferences. Based on these, we should find positive direct effects on school management and school facilities, including staffing. The level of material resources of the home should, however, be related negatively to instructional

effectiveness with parental education having a small direct effect on it. The location of school will affect negatively school physical facilities but should neither affect management nor classroom instruction. Religion, age and sex should have negative effect on the intervening variables.

What should be the effect of each of the variables in our model on pupils? If what we postulate is correct, then all the exogenous variables, except religion, should not have direct effects on attitude outcome. Whether any of the school environmental factors (a set of organizational attributes involving functions such as school management and fiscal support for programmes) has direct consequences for attitude achievement is moot. If there are any effects, then attainment should be influenced by management facilities in the school through teacher-pupil classroom relations. The gains from management and facilities on attitude should be very small, while we expect large positive effects from peer groups or class on attitude.

Identification of Paths

The following set of equations are used to identify the various paths in the causal model of the attitude scale:

$$X_3 = P_{32} X_2 + P_{31} X_1 + P_{30} X_0 + P_{3u} X_u$$

$$X_4 = P_{43} X_3 + P_{42} X_2 + P_{41} X_1 + P_{4m} X_m$$

$$X_5 = P_{53} X_3 + P_{52} X_2 + P_{54} X_4 + P_{50} X_0 + P_{51} X_1 + P_{5v} X_v$$

$$X_7 = P_{75} X_5 + P_{73} X_3 + P_{72} X_2 + P_{71} X_1 + P_{76} X_6 + P_{70} X_0 + P_{78} X_8 + P_{79} X_9 + P_{7w} X_w$$

where:

X_0 = Sex

X_1 = Material possession of the home (MATTPOSS)

X_2 = Parental education (PARENEDU)

X_3 = School management type (SCHPROP)

X_4 = Physical facilities of the school (SCHCART)

X_5 = Classroom characteristics (CLASS/PEERS)

X_6 = School location (SCHLOCAT)

X_7 = Overall attitude (CRITERION)

X_8 = Age

X_9 = Religion

X_u = Error term for school management type (X_3)

X_v = Error term for classroom characteristics (X_5)

X_w = Error term for overall attitude (X_7)

Quantifying the paths

In order to pick out and establish important paths we explored all hypothesized linkages by forming the following set of 'normal equations' from the basic causal model.

$$r_{12} = P_{12}$$

$$r_{23} = P_{32} + P_{31}\, r_{12} + P_{30}\, r_{02}$$

$$r_{13} = P_{32}\, r_{12} + P_{31} + P_{30}\, r_{01}$$

$$r_{03} = P_{32}\, r_{02} + P_{31}\, r_{01} + P_{30}$$

$$r_{34} = P_{43} + P_{42}\, r_{23} + P_{41}\, r_{13}$$

$$r_{24} = P_{43}\, r_{23} + P_{42} + P_{41}\, r_{12}$$

$$r_{14} = P_{43}\, r_{13} + P_{42}\, r_{12} + P_{41}$$

$$r_{35} = P_{53} + P_{52}\, r_{23} + P_{54}\, r_{34} + P_{50}\, r_{03} + P_{51}\, r_{13}$$

$$r_{25} = P_{53}\, r_{23} + P_{52} + P_{54}\, r_{24} + P_{50}\, r_{02} + P_{51}\, r_{12}$$

$$r_{45} = P_{53}\, r_{34} + P_{52}\, r_{24} + P_{54} + P_{50}\, r_{04} + P_{51}\, r_{14}$$

$$r_{05} = P_{53}\, r_{03} + P_{52}\, r_{02} + P_{54}\, r_{04} + P_{50} + P_{51}\, r_{01}$$

$$r_{15} = P_{53}\, r_{13} + P_{52}\, r_{12} + P_{54}\, r_{14} + P_{50}\, r_{01} + P_{51}$$

$$r_{51} = P_{75} + P_{72}\, r_{25} + P_{70}\, r_{05} + P_{78}\, r_{58}\, P_{79}\, r_{59}$$

$$r_{27} = P_{57}\, r_{25} + P_{73}\, r_{23} + P_{72} + P_{70}\, r_{02} + P_{78}\, r_{28} + P_{79}\, r_{29}$$

$$r_{07} = P_{57}\, r_{05} + P_{72}\, r_{28} + P_{70} + P_{78}\, r_{08} + P_{79}\, r_{09}$$

$$r_{78} = P_{57}\, r_{58} + P_{72}\, r_{28} + P_{70}\, r_{08} + P_{78} + P_{79}\, r_{89}$$

$$r_{79} = P_{57}\, r_{59} + P_{72}\, r_{29} + P_{70}\, r_{09} + P_{78}\, r_{89} + P_{79}$$

Zero-order correlations between each of the variables in the basic causal model were obtained so that in P_{ij} the relationship between an independent variable X_j and a dependent variable X_i could be expressed as the sum of the direct effect of X_j on X_i, the indirect effect of X_j on X_i mediated by the relationship of X_j with other independent variables in the model, and any causally unanalysed component.

Table 3.2 ZERO ORDER CORRELATIONS

	Overall scale	Parental education	Material possession	Classroom	Physical facilities	School management	Sex	Age	Religion
1. Overall scale (CRITERION)	1								
2. Parental education (PARENDU)	.08								
3. Material possession (MATTPOSS)	.05	.59							
4. Classroom (CLASS/PEERS)	.24	.11	.18						
5. Physical facilities (SCHCART)	.12	.21	.45	.26					
6. Management (SCHPROP)	.09	.38	.56	.40	.38				
7. Sex	.04	.03	.07	.01	.02	.00			
8. Age	.10	-.09	-.12	.19	.06	-05	.05		
9. Religion	.18	.23	.16	.29	.25	.01	.07	.02	1

These simple correlations enable us to examine the variables not only when they stand alone but also as they enter into a more complex competition with each other. Six variables show moderate correlation with the criterion (i.e., the overall scale) and out of these, classroom effect come up as the highest with .24. In rank order, this result does not differ from the .59 reported by Inkeles and Smith (1974).

One disadvantage about correlational interpretation is that in a simple correlational situation, one can hardly explain how much any variable borrows its manifest strength from another with which it is closely linked. In this regard, multiple regression analysis is considered more efficient.

One basic interest in the path analysis procedure is to estimate the strength of the linkages between blocks of variables and use the magnitude and sign of the coefficients to explain the underlying causal model. To obtain a solution we can either substitute the correlations we have in Table 3.1 into the normal equations we generated or simply regress each endogenous variable on those variables that directly influence it, using unstandardized regression weights as path estimates. Blalock (1964) cautioned on the use of correlations and standardized regression weights and suggested the use of unstandardized regression weights instead. He said:

> The unstandardized regression coefficient is suggested as more appropriate for the statement of causal laws than the correlation coefficient or the standardized regression coefficient since the unstandardized coefficient is relatively stable across subsamples of a population where the standardized coefficients may vary significantly, as a function of the standard deviations.

The argument against the use of standardized regression weights and correlations, as indicated in the above quotation, is that they are unduly influenced by the particular distribution of variables involved in a study. Coleman (1975) recommended the use of the standardized regression coefficient or, where meaningful, the unstandardized regression coefficient. The latter has greater power in generalizing from one study to the next. We, however, used the standardized regression weights because of the shortcomings of the scales on which our predictor variables were measured. With unit variance and zero standard deviation it was possible for us to use beta coefficients to estimate the change in the criterion score which was related to a standard unit variation in the predictor. Path coefficients were therefore identified by beta weights

derived from multiple regression procedures with pairwise deletion for missing data. The formula $\sqrt{1 - R^2}$ was used to determine residual path coefficients.

Table 3.3 SAMPLE CORRELATIONS AND ESTIMATED PATH COEFFICIENTS FOR THE CAUSAL MODEL

Sample Correlations		Standardized Path Coefficients	
r_{12}	.59	P_{32}	.11
r_{23}	.38	P_{12}	.59
r_{13}	.56	P_{31}	.51
r_{03}	.01	P_{30}	-.08
r_{34}	.36	P_{53}	.40
r_{24}	.21	P_{52}	-.00
r_{14}	.45	P_{54}	.17
r_{35}	.40	P_{50}	.01
r_{25}	.11	P_{51}	-.12
r_{15}	.13	P_{43}	.19
r_{45}	.26	P_{42}	-.09
r_{05}	.01	P_{41}	.39
r_{57}	.24	P_{75}	.19
r_{37}	.09	P_{73}	-.00
r_{47}	.12	P_{74}	.06
r_{27}	.08	P_{72}	.05
r_{17}	.05	P_{71}	-.04

Sample Correlations		Standardized Path Coefficients	
r_{67}	.02	P_{76}	.00
r_{07}	.04	P_{70}	.05
r_{78}	.10	P_{79}	.11
r_{79}	.18	P_{78}	.07

For our purpose we decided to use the following as our criteria:

(i) Strong path equals coefficient greater than 0.25

(ii) Moderate path equals 0.11 to 0.24

(iii) Weak path equals 0.05 to 0.10

Table 3.4 [illegible] WEIGHTS FOR OVERALL AND SUBSCALES

	Overall scale	Openness	Readiness	Growth of opinion	Man's ability	Respect for others	Attitude to work	Rely on institutes	Technical skill
Classroom factors	.19	-.05	.06	.20	.16	.16	-.05	.10	.11
Sch. management	-.00	.18	.07	-.06	.00	.00	.06	.00	-.11
Sch. facilities	.08	-.13	.12	.05	.08	-.07	.20	.00	.00
Parental education	.05	-.00	.00	.08	.06	-	-.05	.12	.07
Family material poss.	-.04	-.06	.00	-.13	.00	-	.13	-.10	.06
Sex	.05	.00	.14	.00	.00	.00	.08	.00	-.06
Age	.07	.00	-	.00	-.00	.00	.05	.07	.08
Religion as a whole	.11	-.00	.08	-.11	-.05	.00	.24	.06	.38
Christian religion	.00	-	-	-	-	-	-	-	-

	Overall scale	Openness	Readiness	Growth of opinion	Man's ability	Respect for others	Attitude to work	Rely on institutes	Technical skill
Ancestral worship	-.15	-	-	-	-	-	-	-	-
Moslem religion	-	-	-	-	-	-	-	-	-
School location	.00	-.09	-.06	-	.00	.07	.07	-	-
School by management	-	-	-	-	-	-	-	-	-
Church	.02	-	-	-	-	-	-	-	-
Local authority	-	-	-	-	-	-	-	-	-

Sub-scales

The figures reported in **table 3.4** for the overall scale indicated that classroom factors emerged as the major influence in the total sample and again came out significantly first in three other sub-scales. School facilities, school management and parental education followed next in that order. This outcome clearly demonstrates that classroom or peer group effects, together with other school related factors, make convincing and independent contribution in having children acquire desirable attitudes.

Built into the path analysis method are the techniques for measuring the direct and indirect effects that one variable has on another, and a mechanism that helps us to decompose the correlation between any two variables into a sum of single and compound paths. Using Sewall Wright (1964) method, a compound path is computed by the product of the simple paths comprising it

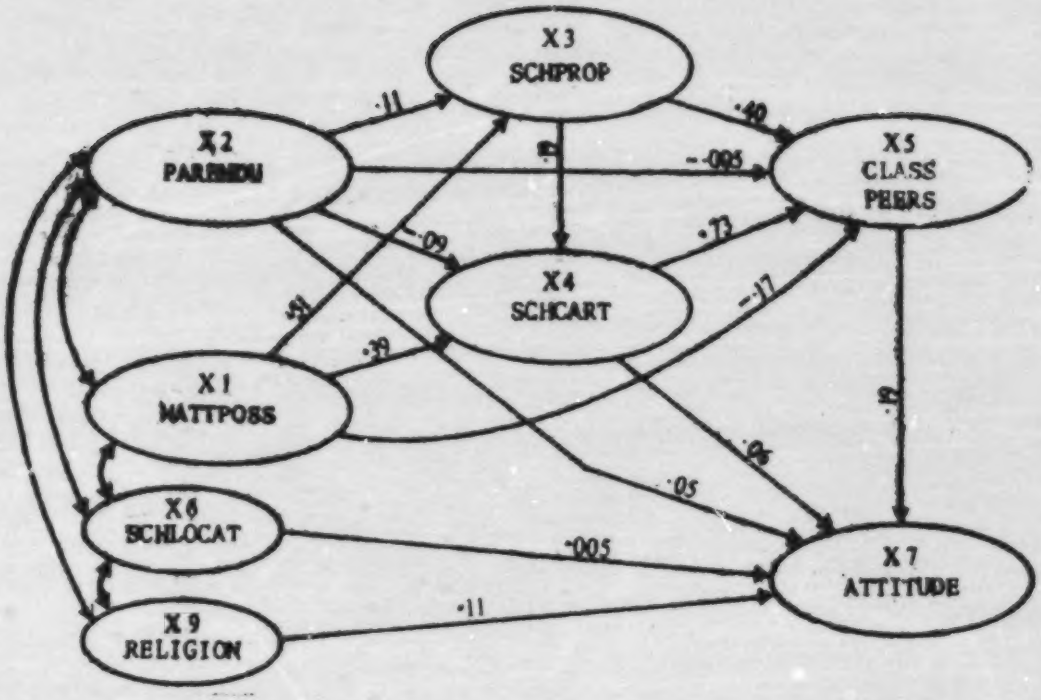

Figure 3.2 MODEL SHOWING PATH COEFFICIENTS

Explaining the Paths

Considering the values of the path coefficients, classroom or peer group characteristics again had the strongest direct effect on the criterion. This indicates that, in general terms, the higher the class level of the child, the better he performed on the attitude scale. This finding confirms the results of variance and multiple classification analysis already reported. Other variables like religion, age, and school structural facilities in that order, had moderate paths. The paths from parental education and material possessions of the home to the criterion indicate the weakest links among the direct paths. The negative sign of the latter's path to CLASS and the weak regression coefficients reported for Material Possession (MATTPOSS) and Parental Education (PARENDU) seemed

to suggest that children from good homes performed poorly on the attitude scale and that physical quality of the school did not influence them as much as it did to children from relatively poor homes in acquiring desirable attitudes. The existing links from School Management (SCHPROP) and School Structural Facilities (SCHCART) to CLASSROOM characteristics were expected. PARENDU had a near to nil path to CLASSROOM while MATTPOSS led a strong negative direct path to CLASSROOM. However, both PARENDU and MATTPOSS had strong links with SCHPROP and SCHCART. These observations show that quality of school has a tremendous influence on children, as far as attitudes are concerned; hence, we have strong direct paths from SCHPROP and SCHCART to CLASS. Even though the home (i.e., PARENDU and MATTPOSS) does not seem to be as effective as the school, its effect is seen in its strong links with SCHPROP and SCHCART. Probably, parents with good educational and financial backgrounds obtain quality schools for their children.

Instead of reporting significance levels for the effects observed as usually done through ANOVA, we adopted the decomposition method to explain how much confidence we can put on path-analytical results.

Decomposition of Effects into Direct and Indirect Components

A general method for decomposing total effects into their constituent direct and indirect effects suggested by Duncan (1975) is adopted here.

Table 3.5

Dependent	Influencing Variables	Total Effect	Indirect Effect X3	Indirect Effect X4	Indirect Effect X5	Direct Effect
X_3	X_1	.51				.51
	X_2	.11				.11
	X_6	-	-	-	-	-
	X_9	.10				.10
X_4	X_1	.39	.097			.293
	X_2	-.09	.021			-.111
	X_6	-	-	-	-	-
	X_9					
	X_3	.19				.19
X_5	X_1	-.12	.204	.016		-.34
	X_2	-.005	.044	.004		.05
	X_6	-	-	-	-	-
	X_9					
	X_3	.40				.40
	X_4	.17				.17
X_7	X_1	-.04	-.005	.006	.003	-.03
	X_2	.049	-.001	.001	.007	.04
	X_6	.005	-	-	-	-
	X_9	.11				.11
	X_3	.001				.001
	X_4	.06				.06
	X_5	.19				.19

The table 3.5 illustrates the effects of seven major variables. Let us examine decomposition effects of each in the model:

(i) X_1 (MATTPOSS) has an effect of .39 on X_4 (SCHCAMT) of which .097 or 25% is contributed by or transmitted through X_3 (SCHPROP).

(ii) X_2 (PARENDU) has an effect of -.09 on X_4 of which .021 or 22% is transmitted via X_3. You may notice that in the next two variables (in Table 3.5 X_5 and X_7, direct and indirect effects) counteracted each other. These are clear cases of supressor effects so that the total effect is less than the sum of the absolute effects. Also, some components appeared to be larger than the total effect. A solution to this kind of situation (where components are larger than the total effects) is simply to express the various components as proportions of the sum of their absolute.

(iii) In the light of the explanation above, X_1 may now be interpreted as having its effect on X_5 (CLASS/PERM) via X_3 and X_4. In the process, .204 or 60% is contributed by or transmitted via X_3 and .016 or 4.7% via X_4, and finally .12 or 35.3% is unmediated in other words, this is the real effect of MATTPOSS on CLASS.

(iv) In the same vein, X_2 has on the whole very little direct effect on X_5 and in doing so .044 or 88% is transmitted via X_3 and .004 or 8% via X_4.

(v) Finally, RELIGION and CLASS have strong direct influence on children's attitude. The indirect influences are negligible.

SUMMARY

The purpose of this chapter was to gain an insight into some specific aspects of the school environment that would enable us to make the assertion that school children who have had more exposure to these identified school qualities acquired more desirable attitudes. In this attempt, we focussed on school administration and structural facilities both inside the classroom and in the school as a whole to measure the schooling environment. The finding supported our hypothesis that structural features of schools contribute substantially to school children's attitude in Ghana. In addition, evidence was produced to show that the relationship between quality of school environment and desirable attitude orientation is largely independent of several alternate environmental processes that also influence attitudes.

CHAPTER 4

MAJOR FINDINGS

CONCLUSIONS

With the goal of assessing the impact of schooling on children's attitudes, our research has investigated some environmental properties of schools which to our mind pose problems for policy makers and for children who pass through the school system. In doing so our basic interest was on the structural dimensions of elementary schools; but we also examined and assessed some home factors in order to weigh the relative contribution of both environments after the influence of other competing elements such as urban/rural origin, sex, and religion had been considered. By doing this, we were able to ascertain the independent effect of schooling experience in order to give support to our theoretical stand that schooling affects in a definite, positive direction the attitudinal values of children and that this is quite independent of other generally accepted factors.

The results emphasized, though by inference, the importance of school quality (apart from normal curriculum effects) in exerting influence on the formation of desirable attitudes:

1. Elementary school children attain higher attitude levels than non-school children of comparable socio-economic status and age. Differences in the mean scores between school and non-school groups is significant.

2. The means of the various grades show that the longer children have been exposed to school influence the better their attitude scores. This finding is supported by results from MCA and path analysis, thus discounting any claims that significant differences observed could be due to chance elements.

3. The quality of physical structures of the child's school environment correlates with the child's attitude score.

4. The positive association between schooling and individual attitude attainment cannot be explained or interpreted entirely by other alternative forces such as the home. A causal model was used for the analysis, with home influence, sex, religion, age, and urban/rural origin, controlled separately. School variables were found to maintain their independent association in the face of all competing factors.

5. In affluent societies, the home environment is commonly associated with the child's process of acquiring desirable attitudes and is found to exert greater influence on the child than are other environmental factors. This study, however, could not support this finding. What we observed from the path analysis was that parental education and wealth had little direct effect on individual attitudes. But the path analysis put this finding in a different perspective by showing that home influence was

manifested in the choice of schools by parents. Also observed was that children who were high on home items were equally high on school variables.

DISCUSSION

The research has raised quite a number of issues, the implications of which should concern policy makers as well as educational planners.

Our stand on gathering information from young children was made clear in the rationale for the study. We have succeeded in collecting useful data from children between six and twelve years of age, although other difficulties have emerged in the process, compounded by the current national debate on how many years of free and compulsory education the state should provide. Some of these problems are: To what degree would children of ages six to twelve be able to learn and practise what the schools have to offer with regard to attitude? Will passage of time between the first terminal point in schooling and adult life produce retention loss to such an extent that the validity of formal basic education could be questioned?

In recent years, three committees have reviewed the structure and content of education in Ghana. Each committee (Evvissah, Dzobo, Ampene) recommended nine years of basic education, which is the same as the functional literacy level in UNESCO terminology. Other organizations have recommended seven years. The reports from these committees adequately defined basic education in terms of policy and content, but

were rather vague on prescribing what school outcomes the state expects its educational institutions to achieve at each terminal point. One could therefore challenge the basis on which these bodies fixed the first terminal point at seven or nine years of schooling.

The results reported in these pages showed that improvement in attitude scores was observed in every successive year of schooling for all grades. We further observed that attitudinal influence of the home is less effective than school influence.

In light of this evidence it is obvious that the unfortunate child whose education terminates at class six or seven, when learning has not yet taken root, will be thrown back into a less challenging environment where lessons learned in school will be subject to the interference of non-controlled influences. Retention loss due to many interacting forces is possible. Nine years free education is laudable, but if the present state of the economy cannot sustain free and compulsory education beyond six or seven years of schooling, then a possible alternative is to persuade institutions of production such as the Volta Aluminium Company (VALCO) and the Cocoa Marketing Board (CMB) to perform part of the educational functions.

Another finding showed that home influence is mediated through the school, that is, parents are willing to create good educational environments for their wards. This is indicated by the fact that children with high home environment scores were equally high on school quality responses. This finding brings into focus issues of the boarding school system in Ghana, where tuition is free and boarding fees are heavily

subsidized by the State. Since there is enough evidence that the affluent in the society are willing to provide quality schools for their wards we believe that boarding costs should become the responsibility of parents. This would, of course, limit access by poorer families to these schools, and many people have expressed concern that such a policy would benefit only children of the elite and, in turn, retard democratization of education in Ghana. We, however, differ in our assessment. The ratio between boarding costs and funds for textbooks is six to one. Savings derived from the boarding system could be diverted to provide classrooms and badly needed textbooks for children who would otherwise have been deprived of educational opportunities.

Two major factors have emerged: that physical environment is an important aspect of the school and in need of reform, and that improvement in attitude performance is commulative and therefore one should look at the total schooling effect rather than at the less important yearly gains. With this we conclude that our attempts have clarified the role of formal elementary education in exerting a positive influence on children's attitudes.

APPENDIX I

ANOTHER VIEW ON ANALYTICAL STRATEGY

Kahl (1968) and Inkeles and Smith (1966, 1974) defined what they termed 'Individual Modernity' as a set of attitudes and values that formed a cohesive syndrome. They presented several themes which presupposed composite scales. Since we adopted some of the scales and adapted others to depict a school child having what we described as desirable attitude qualities in our culture, it was necessary to treat each subscale independently and then form an index of the components to measure pupils on them. The issue of scale homogeneity is examined in Appendix II, where we deal with realiability and validity of Inkeles and Smith's OM scale in the Ghanaian cultural background. The purpose of this section then, is to examine some methodological and analytical issues and, on the basis of these, outline our data analysis procedures. Preliminary results of simple descriptive statistics are also reported.

It is intended that this pilot study will be followed by cross-sectional and longitudinal investigations. For the three studies a control group (schoolers and non-schoolers) design was adopted. With regard to the present study, sampling was done with varying degrees of randomness. Pupils were randomly selected at the classroom level while teachers remained intact with their classes. Stepwise regression procedures and analysis of variance and covariance were intended to be used in processing the data. At the initial stages, the present data were, in fact, subjected to variance and covariance analysis but these were later abandoned when we discovered the existence of some methodological inconsistencies. These inconsistencies are bound to emerge

clarity when we embark on cross-sectional and longitudinal studies. But methodological and analytical approaches should be consistent in all the studies, since we envisage a more comprehensive investigation concerned with determining relationships among home environment variables, classroom variables, teacher characteristics, and curriculum outcomes in terms of achievement and attitude during the second and third phases of the study.

Unfortunately, this is not going to be so if we stick to our original strategy. During our recent interview sessions, pupils were randomly selected from classroom to classroom while their teachers, who also formed an integral part of the experiment, were not randomized. This and many other site observations raised issues of methodology and analysis. We wondered whether the investigations should adhere to methodological controls and be carried out under traditional experiment conditions or whether we should carry out the studies under natural conditions using intact classrooms with the same teachers in charge of classes as before, and make no attempt in subsequent studies to shift students to different learning conditions in order to satisfy traditional experimental conditions.

Reeves and Lewis (1979) provided good reasons to conduct studies using intact classrooms. The first is representativeness. They argued that it might not be advisable to use experimental situations of randomly assigning teachers and pupils to experimental groups or in any way manipulate teacher behaviour, because such situations have little in common with complex natural environments. They suggested that intact classrooms in real situations should be allowed to covary as they do in the natural setting. This approach, they felt, might simplify data collection.

The choice of intact classrooms, however, raised three major issues, namely: appropriate procedure for data analysis, significance testing, and unit of analysis. Any answer to the last issue must be based on the type of inference to be drawn about learning and teaching conditions under survey. That is, whether concern is about individuals or groups.

From the way we carried out sampling of pupils and involved teachers on the measures, we could not claim to have carried out random sampling to its logical end. It is not possible now, knowing conditions in Ghana, to set up a fully designed experiment on a large scale, in which all the participants are selected at random from a population and in which teachers are assigned at random, having first been randomly selected from a defined population. To justify the use of analysis of variance, therefore, is difficult; and since we did not randomly assign pupils to treatment groups (that is, to the various predictors of the study), it was likely that there were differences between groups before the application of the treatment. This situation would happen in intact classroom setting as well as experimental situations. Under these circumstances the use of simple analysis of variance procedures will clearly produce unsound results. An alternative to this procedure could be to obtain some measure of the level of performance of the groups prior to the administration of the treatment and to adjust the criterion scores by analysis of covariance procedure - a method likely to be used in the longitudinal study. Again, the use of the covariance analysis in this way was attacked by Elashoff (1969) and by Cronbach and Furby (1970), because the assumptions underlying the use of covariance analysis would be contravened.

The problem still remains of how best to analyse the data in order to obtain some estimate of the effects of the predictors of our study or estimate of change in performance between two testing periods for the longitudinal study. Linn and Kent (1969) suggested four approaches:

1. The partial correlation between (A) and (N) with the prior performance variable (R) controlled $[\sqrt{AN.R}]$ (Fig. A-1).

2. Part correlation between (A) and (N) with the effects of the prior performance variable (R) removed only from (A) $[\sqrt{(A.R)N}]$. This is the square root of the marginal variance or unique variance of (N) explained by (A) in a stepwise regression analysis with both (R) and (A) entered as predictor variables and (N) as criterion variable (Fig. A-2).

3. Part correlation between (A) and (N) with the effects of the prior performance variable (R) removed only from (N) $[\sqrt{A(N.R)}]$. This is the analysis of covariance generally used in studies of teaching behaviour (Fig. A-3).

4. The standardized partial regression weight of (N) on (A) obtained from the regression equation in which the predictor variable (A) and the prior performance variable (R) are both included in the regression equation with (N) as the criterion variable $[^{b}NA.R]$ (Fig. A-4).

It now remains to state the form of our problem to take into account the pilot study, as well as strategies for the two studies to

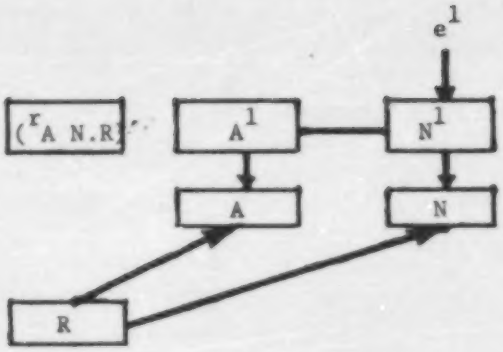

Fig. A-1: Procedure 1

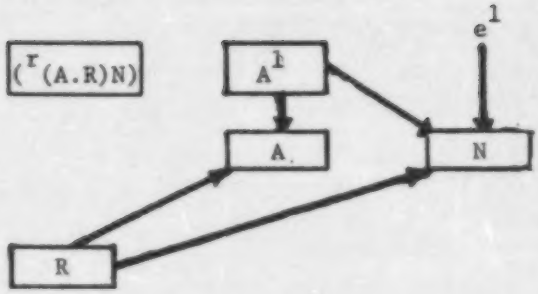

Fig. A-2: Procedure 2

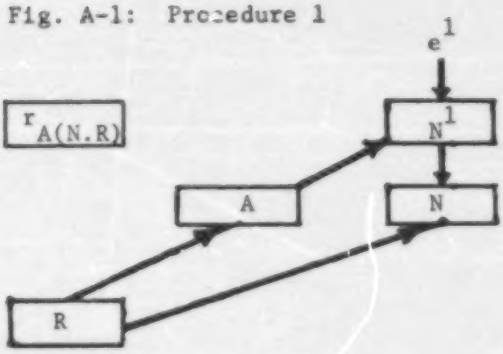

Fig. A-3: Procedure 3

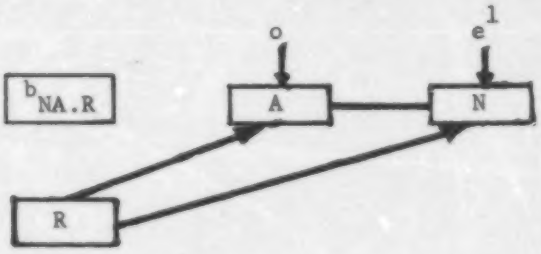

Fig. A-4: Procedure 4

follow. The problem restated is that we have made independent or predictor variables (A) associated with the home, school, teacher characteristics, and teaching behaviour prior in time sequence to the criterion variable (N), with a measurement taken on a variable to assess previous performance (R), which is in turn antecedent to (A) and (N). This accepted, the resolution of the problem rests with finding appropriate procedure that will establish causal relationships linking prior performance (R) and both the predictor variable (A) and the criterion variable (N). We then argue that the principle of sequence operates in the way we set up the study and that prior performance (R) exerts impact on the predictor variable (A) and that (R) has influence on the criterion variable (N), and conclude that the fourth procedure is the most appropriate to use. See Figure 4.

Procedure 2 is unsuitable because it takes no account of the influence of the prior performance on the criterion when considering the relationship between the criterion and predictor. In any naturalistic investigations, where neither individual students nor intact classrooms have been randomly assigned to treatment groups, we cannot say with any certainty that prior performance does not influence teacher characteristics in the classroom on the behaviour of teacher and his pupils in the classrooms; and from the way our schools function there is bound to be a relationship between the prior performance variable (R) and the predictor variable (A), which we call treatment, so that the covariance analysis of procedure 3 is inappropriate. What this, in effect, means is that, unless the correlation between prior performance variable (R) and predictor variable (A) is zero, the use of covariance is questionable.

In Procedures 1 and 4 the effect of prior performance has been partialled out from predictor variable (A) and the criterion variable (H). Regression analysis (though not stepwise) is preferable because the results are more readily understood.

Summary

In summing up we have argued that the research study is the type in which the prior performance variable (R) serves as antecedent to the predictor variable (A) and the criterion variable (H) and exerts influence on both. In pursuit of this causal model our analysis will involve obtaining descriptive statistics at the initial stages followed by MCA and path analysis procedures.

APPENDIX II

RELIABILITY AND VALIDITY OF THE SCALES

Eight attitude scales were used in this study. Some of the items we used were taken directly from Inkeles and Smith's OM3 scale; and others were adaptations of it in order to fit cultural differences.

There is no doubt that the original OM scale was refined to obtain high reliability and validity. We should, however, remember that the scale was used about 1972 and this means an eight to ten years difference between the study referred to and ours, which is yet to start on national basis. It is true also that both research studies are located in less affluent societies and the Ghanaian one is taking place during a decade of rapid social change. In these circumstances, concern has been expressed about using the same scale for two distinct age groups (school children and working adults) even though the literature revealed that the scale had been used successfully on children elsewhere. This, the critics pointed out, might affect the reliability of the scales.

Accordingly, it is desirable to ensure constancy of the scales over time. For internal consistency, the alpha coefficient — the most popular internal consistency measure — was suggested and in fact, used at one stage in the analysis. But this poses difficulties. Novick and Lewis (1967) have demonstrated that alpha is not equal to the reliability of composite scores, but instead is a lower bound to it. They further proved that if the items are tau-equivalent, that is, the true scores on one item differ from the true scores of another item, just by a constant,

then alpha is an exact estimate of the reliability. Heise and Bohrnstedt (1970) derived the statistic **omega** and proved that whenever items are tau-equivalent alpha and **omega** should equal each other. Under this condition inter-item **correlations are** equal and item variances are also equal, otherwise omega will be larger than alpha. We have subscales and therefore decided to use omega statistic in estimating reliability of our subscales.

Apart from reliability issues, there is also the problem of validity. We expect that differences in children's score, to a large extent, represent differences in the attitude we are investigating. But attitudes are abstractions we infer from case responses and if, as we claim, social values fluctuate, then it is likely that the constructs we are trying to elicit are unstable and for that matter the scales may measure different constructs.

In view of all this, we have decided to look at validity of the subscales also. We used a very simple strategy:

1. We factor analysed a set of twenty-eight items to determine the relationship of items underlying factors or causes. Factors which are strong indicators (based on factor **loadings**) formed linear composites . The number of items used agreed with Nunally's suggestion to use $\frac{N}{10}$ items, when they are to be factored simultaneously (Nunally 1967: 257).

2. Reliability and validity indices of the composites were estimated by using Heise and Bohrnstedt (1970) derivations.

Missing Data

There was consensus among interviewers that the original overall scale was too long and children became tired during the interview sessions. We therefore computed estimates for half the total number of items. Missing data on these items were relatively small ranging approximately between zero and three per cent except on item twelve where the percentage for missing data was high.

FACTORIAL COMPONENTS ANALYSIS

Analysis

Principal components analysis without iteration and varimax rotations were used. The number of factors was selected to correspond with the number of scales into which the items had originally been put. From the results of the factor analysis, a revised clustering for each set of items was carried out. It would have been better if principal components analysis were again carried out on the revised clustering for any misplaced items. This was not done. The number of subfactors in each scale was determined simply by the highest positive value loadings. Generally, the number of subfactors within each scale is determined by the Kaiser criterion of accepting principal components with latent roots greater than one.

The factor analysis revealed that the number of principal components with latent roots greater than one were more than the required number of factors. Probably, this was due to factor analysing at the item level. The table 4.0 shows the factor structure of the item.

Table 4.0 FACTOR STRUCTURE OF ITEMS

1.	Number of principal components with latent roots	1	12
2.	Percentage of variance explained by them		63.0
3.	Number of principal components with latent roots	2	2
4.	Latent root of the first principal component		2.33

Table 4.1 PRINCIPAL COMPONENT ANALYSIS OF ITEMS

Original item clustering	Factor loadings without value restrictions					
	1 Factor	2 Factor	3 Factor	4 Factor	5 Factor	6 Factor
Attitude 1						
1 - 6						
1	.478					.24
2			.409			
3		-.22	.587			.213
4	.262		.655			
5	.521		.227			
6					.25	-.28
Attitude 2						
7 - 13						
7	.296	.330				
8	.401		-.223	.313	.292	
9	.217			.511		
10		.304				.43
11	-.253	.269				
12		.233	.265	-.367	.339	
13	.457					

Original item clustering	Factor loadings without value restrictions					
	1 Factor	2 Factor	3 Factor	4 Factor	5 Factor	6 Factor
Attitude 3						
14 - 19						
14	-.421		-.354		.224	.215
15		.17			.483	
16	-.453					.288
17						
18	-.28			.631		.567
19				.733		.332
Attitude 4						
20 - 28						
20	-.597	.263				.429
21		.374	.244	-.205		
22				-.19	.402	
23		.747				
24		.735				
25	.164					.536
26						
27			.11		.495	.584
28		-.197		.19	.557	

The analysis indicated that all the subscales could be regarded as heterogeneous. This observation does not preclude composite scales

from being a measure of some general factor. Heterogeneity, however, prevents the use of alpha, a substantial level of which shows homogeneity and high correlation among subscales. This situation emphasizes our decision to treat each subscale independently. With the number of factors restricted to six, the solutions are shown in the Table 4.1. Only loadings greater than or equal to .11 are reported.

Scale Revision

Based on the factor analysis, the attitude scale is revised as below:

Table 4.2 PRINCIPAL COMPONENT SOLUTIONS FOR FACTOR 1 (OPENNESS)

Item	Factor structure	Factor score coefficient
1	.478	.221
5	.521	.257
8	.401	.177
13	.457	.220
25	.164	.039

The first factor here is Openness to New Experience. Only two of the original six items loaded on this scale. The remaining three items were a mixture of items from Attitudes 2 and 4 of the original subscales. A departure from the scoring specifications is shown by the negative loadings on items 14, 16 and 20, indicating that pupils with favourable attitudes to other items in this scale tended to disagree with these three. It is possible that the key scorings are inappropriate. Despite the high absolute loadings on them, they are deleted from the present computations.

Table 4.3 PRINCIPAL COMPONENT SOLUTION FOR FACTOR 2 (READINESS FOR SOCIAL CHANGE)

Item	Factor structure	Factor score coefficient
7	.330	.192
10	.304	.159
11	.269	.144
20	.263	.110
21	.374	.203
23	.747	.399
24	.735	.385

The second factor loaded on four items of the original scale as well as on four items from the original Attitude 4 (Confidence in One's Ability and the Ability of Man ...). Children appeared to have used different criteria in responding to the scale items. To Inkeles and Smith, these are efficacy questions and refer to man's potential for mastery over nature and the sense that one can effectively do something in concert with other men to bring about changes.

Let us examine the items in question. Item 21: 'If you were president what would you do?' Children tended to answer this question by indicating changes they would like to see take place in their community, and seemed to have avoided our idea that a favourable response meant personal confidence.

Item 23: 'Do you think that we can understand the causes of

thunder, rainfall and lightning?' and Item 24: 'Do you think we can understand how a seed turns into a plant?'

What children seemed to have done to these questions was to respond to the first part — — that changes were bound to come through man — — but did not see themselves, at their tender age, as part of the solution.

Table 4.4 PRINCIPAL COMPONENT SOLUTION FOR FACTOR 3 (GROWTH OF OPINION)

Item	Factor structure	Factor score
2	.409	.229
3	.587	.327
4	.360	.36
6	.278	.278
12	.265	.138
15	.17	.11
27	.11	.05

Factor 3 derived as many as four items from the original Attitude 1 and two other items from original Attitudes 3 and 4. The items that switched from Attitude 1 were investigated. They all involved willingness on the part of the respondent to move from their present community to another place far away. The items failed to consider one crucial element, and that was the reasons for changing their present locations. It is felt that if interviewers had made it abun-

dantly clear that moving to a new environment promised better life, the expected trait might have been tapped. Consequently, readiness for the new experience which we were seeking should depend on chances of improved standard of living.

Table 4.5 PRINCIPAL COMPONENT SOLUTION FOR FACTOR 4 (EFFICACY)

Item	Factor structure	Factor score
9	.511	.285
18	.631	.360
19	.733	.409
28	.185	.18

Factor 4 seemed not to have loaded on any items from the original scale. But a close examination of the efficacy construct reveals two components: Confidence in one's ability and confidence in the ability of man. Naturally, the factor analysis split the items neatly to account for the two factors. For the purposes of this exercise, however, only one factor is used.

We present the reliability and validity results as follows:

Table 4.6 SUMMARY TABLE FOR ORIGINAL SCALE

Factors	Reliability		Validity
	Alpha	Omega	Pts
Attitude 1	.41	.65	.25
Attitude 2	.21	.63	.07
Attitude 3	.29	.60	.33
Attitude 4	.43	.65	.06

Table 4.7 SUMMARY TABLE FOR REVISED SCALE

Factors	Reliability	Validity
	Omega	Pts
Factor 1	.56	.74
Factor 2	.66	.88
Factor 3	.63	.78
Factor 4	.65	.84

Suggestion

Since Cronbach's alpha is an exact estimate of reliability only under tau-equivalent assumptions of equal intercorrelations and equal variances, the use of Heise and Bohrnstedt's omega is preferable. Table 4.6 compares alpha and omega reliabilities and the latter estimates exceed alpha as expected.

Evidence from the factor analytical results shows that the traits are correlated, and that some part of the correlation may be due to the influence of other traits that are correlated with that of interest. We feel, however, that this is not the case with some of the items singled out earlier. We think that children have not used the same criteria that adults would in constructing the scales. Factor loadings show the extent to which latent traits influence scores and if factors are out of alignment with latent traits, factor loadings have little meaning. It is therefore desirable to take a fresh look at item clustering to ensure that factors and latent traits are adequately aligned.

APPENDIX III

PRESCRIBED VALUES AND ATTITUDES SCALE

Notes to the Class Teacher

Purpose: The purpose of the questions and statements in these pages is to collect from some of your pupils information which can be used to improve the quality of education in our primary schools. The exercise will in no way affect adversely the performance of the pupils in their school work either now or later.

Request: We are requesting that you help us administer very carefully the instrument to the pupils concerned making sure they understand each item before responding to it. It will take only about 30 minutes to administer the instrument to each of the pupils.

Confidentiality: The names of the pupils and the schools participating in this exercise will remain strictly confidential. The pupils' individual responses will not be made public at any time.

SECTION I: BACKGROUND INFORMATION

1. Name _____

2. Age (in years) 86

3. Sex (Put an "X" in the appropriate space)

   (a) Male _____ Female _____

4. Place of birth (Write the name of the village or town in the appropriate space.

   (a) Village _____ (b) Town _____

5. Name of school presently attending _____

6. Present class in school (Circle as applicable)

   Grade I, II, III, IV, V, VI

7. No. of years so far spent in school including the present school year _____

8. Religion (Put an "X" against the pupil's response)

   (a) Christianity _____ (b) Islam _____ (c) Others_____

9. Socio-economic status

   (a) Parent's level of education (Put an "X" in the appropriate space)

Parents	No Schooling At All	Completed Primary Education	Completed Secondary Education	Completed Post-Sec. Education	Don't Know
Father					
Mother					

   (b) Father's Occupation _____

   (c) Mother's Occupation _____

(d) Parents' affluence (Put an "X" against the pupil's response indicating the items which are available in his home among the following)

i. Car _____ ii. Television _____ iii. Radio, Player or Stereo _____ iv. Gas Cooker _____ v. Refrigerator (fridge) _____ vi. Beds

None _____

Wooden _____

Iron _____

vii. Books (apart from the Bible or the Koran) _____

viii. Toilet facilities

none _____ Palm Frond Laterine _____

Flush (Water system) toilet _____

ix. The type of house in which the pupil and his parents live

mud house _____ plastered (cemented) house _____

a furnished flat _____

SECTION II: RESEARCH DATA

I. OPENNESS TO NEW EXPERIENCE

10. (Suppose) many strangers visit your town/village each year. Do you think this is a good thing?
Good, Bad, Not Sure, Don't Know, Others.

11. Suppose your parents ask to choose between going on holidays with them to _____ (nearby town) and going on holidays with them to _____ (dist. town), which would you choose? Nearby Town, Distant Town

12. Would you be willing to move from your present school to a school in a far away place where the people eat food and wear clothes that are different from yours?

Move, Stay, Don't Know, Other

13. Some people want to live in town or cities while others want to live in villages. Where do you want to live?

City, Village

14. You have your friends at school. A new boy/girl comes to your school. Would you make him/her your friend?

Make friends, Don't make friends, Don't Know

15. If you could live anywhere you wished, where would you prefer to live?

Why? _____

II. READINESS FOR SOCIAL CHANCE

16. Suppose someone in your class makes higher marks than you, what would you say is the cause?

- The child works harder than me
- The child has good luck
- The teacher likes him better
- The child has joy in his work
- Don't Know
- Other

17. Suppose a child in your class becomes very ill, where should the child be taken for treatment?

- hospital
- church/mosque/prophet/jujuman
- herbalist
- don't know
- other

18. Suppose your father said something that you know is not true would you correct him?

Yes No Don't know Other

19. Some people say mummy should cook all the time. Other people think daddy should help to cook at times. What do you think?

- Mummy cooks all the time - Daddy cooks at times
- Daddy cooks all the time - Don't know

20. Some people say boys are better than girls. Do you agree?

No Yes Don't know

Interviewer:

If no, what do you think?

girls are better than boys

girls and boys are the same.

21. If you score a high mark on your test in school, what would you say is the cause?

I work hard, the test was easy, the Teacher likes me

I don't know, Other

III. GROWTH OF OPINION

22. When members of your age group disagree with you, what do you do?

I change my mind, I hold on to my opinion,

Don't know Other

23. Most of the time older people decide on everything. Do you think this is right?

No, Yes, Don't know, Other

24. When persons younger than you disagree with you, what do you do?

I change my mind, I hold on to my opinion, Don't know, Other

25. When persons older than you disagree with you, what do you do?

I change my mind, I hold on to my opinion, Don't know, Other

26. Do you always say what you think?

Yes, No, Don't know, Other

27. If you have something to say do you say it?

Yes, No, Don't know, Other

IV. CONFIDENCE IN CHILD'S ABILITY AND CHILD'S ABILITY OF HIM TO ACHIEVE HIS OBJECTIVES

28. Bad things happen. For example a child falling down and breaking his leg while running. Is it possible for a child like you to stop such bad things?

Yes, No, Don't know, Other

29. (a) If you were President/Head of State what would you do?

(b) Why would you do such a thing?

30. Some people are born poor. Do you believe these poor people can become rich?

Yes, No, Don't know, Other

31. Do you think that we can understand the causes of things like rainfall, lightning and thunder?

Yes, No, Don't know, Other

32. Do you think we can understand how a seed turns into a plant?

Yes, No, Don't know, Other

33. (a) Some people say children who don't go to school are better off than children who go to school. What do you say?

Children in school are better off

Children out of school are better off

(b) Why _____

34. Suppose a family has child who steals. Do you think that family can make that child stop stealing?

Yes, No, Don't know, Other

35. Some people believe human beings (Ghanaians, Nigerians or Liberians or Sierra Leoneans) can do whatever they decide to do. Do you believe this?

Yes, No, Don't know, Other

V. BELIEF THAT OTHER PEOPLE AND INSTITUTIONS CAN BE RELIED UPON TO FULFIL THEIR OBLIGATIONS AND RESPONSIBILITIES

36. Suppose people are fighting nearby. An unknown policeman offers to take you away from the area. Will you follow him?

Yes, No, Don't know, Other

37. (a) When your parents promise to buy things, do you expect them to do so?

Yes, No, Don't know, Other

(b) Interviewer: If yes, probe for frequency, i.e., how often?

38. If a man steals or does something bad, do you believe he will be caught and punished by the government?

Yes, No, Don't know, Other

39. Suppose your teacher says your class will pay a visit to the post office (or any place of interest), would you start making plans for the trip?

Yes, No, Don't know, Other

40. (a) When members of your age group promise you things, do you expect them to fulfil their promises?

Yes, No, Don't know, Other

(b) Interviewer: If yes, probe for frequency, i.e., how often?

41. Suppose your dad says he will give you 1 (Dollar, Naira, Leone, Cedi) today, but if you wait for 10 days he will give you 5 (Dollars, ...). What would you do?

Take one dollar, Take five dollars later,

Don't know, Other

42. You and some other children have volunteered to clean dirty roads in your town/village. Do you think the other children will do their part of the work?

Yes, No, Don't know, Other

VI. VALUING OF TECHNICAL SKILLS

43. Suppose you are a _____ farmer.

This year your crop is not growing well. What would you do?

Do something technical, Ask for technical advice,

Do something non-technical, Do nothing, Don't know,

Other

44. Some people think it is important for a child to know how to make his own toys such as (boats and wire cars). What do you think?

It is important, It is not important, Don't know,

Other

**Example should match sex of child, e.g., boys _____ wire cars; girls _____ baby dolls.

45. See **2 under Readiness for Social change

46. A lorry has broken down and the owner can't make it run. Call a mechanic, abandon the lorry, pray about it, don't know, Other

47. Suppose your village/town/city has neither hospital nor church/mosque. Your village/town/city has money to build only one of these. Which one would you like to be built?

Hospital, Church/Mosque, Don't know, Other

Interviewer: Probe why?

48. What would you like to be when you grow up?

VII. RESPECT FOR OTHER PEOPLE'S DIGNITY

49. Suppose you did something wrong in class and the teacher decides to punish you. Where would you prefer to be punished? In front of your classmates or in the Principal's Office?

In front of classmates, In Principal's Office

Don't know, Other

50. Suppose a classmate did something wrong in class and the teacher decides to punish him/her. Where would you prefer he/she to be punished? In front of his/her classmates or in the Principal's Office?

In front of his/her classmates, In the Principal's Office, Don't know, Other

51. Suppose you did something wrong in _____ (a public place, e.g., lorry park). Should your mother punish you there, or should she wait and punish you at home?

Punish me there, Wait until we get home,
Don't know, Other

VIII. ATTITUDE TO WORK

52. Do you think a school boy/girl like you should do work at home?

Yes, No, Don't know, Other

53. Suppose a man has many children and sends them all to school. Should the children come home and help with the house work or should their father get a houseboy?

Children should help, Father should get a houseboy, Don't know, Other

54. Some people think that a person who has gone to school should not cut grass or chop wood. What do you think?

He should cut grass and chop wood,
He should not cut grass or chop wood,
Don't know
Other

55. Do you like to do work at home?

Yes
No
Don't know
Other

56. Do you enjoy doing or fixing things with your hands?

Yes

No

Don't know

Other

APPENDIX IV

SCHOOL RESOURCES INDEX FORM

(SCHOOL ENVIRONMENT)

Note to the Researcher/Research Assistant

A number of statements are presented on these pages. You are to use the statements to check certain conditions and resources available in some of our primary schools and record them exactly as you find them. For a few of the items you will find it necessary to interview the headmasters of the schools.

It is absolutely necessary to seek the fullest co-operation of each headmaster in order to obtain all the information required. You may therefore have to let each headmaster know that the purpose of the exercise is to collect information which can be used to improve the conditions of our primary schools. It has nothing to do with the performance of the school or the efficiency of the headmaster and all information collected will remain strictly confidential.

N.B. Please put an "X" as appropriate against items 3, 4, 5, 6, 7, 8 and 11.

1. The name of this school is: _____

_____

2. The mailing address of this school is _____

_____

3. This school is located in:

(a) a rural area _____ (b) an urban area _____

4. Proprietorship (or Religious tone) of the school

(This school is):

(a) a mission (church) school _____

(b) a moslem school _____

(c) a government school _____

5. Sex composition of the school (This school is):

(a) an all boys school _____

(b) an all girls school _____

(c) a mixed school _____

6. Population of the school (The number of pupils in this school is):

(a) Less than 250 _____

(b) above 250 _____

7. Most of the buildings in this school

(a) i. have mud walls _____

ii. have concrete (cement block) walls _____

(b) i. have uncemented floors _____

ii. have concrete (cemented) floors _____

(c) i. have no ceilings _____

ii. have mat ceilings _____

iii. have high quality ceilings _____

8. Library facilities available in this school

(a) none _____

(b) only a reading corner in each class _____

(c) central (or common) library _____

9. Recreational facilities available in this school

(a) Sports for which there are separate playgrounds

1

2

3

4

5

(b) Materials available for sports and games

Names of materials	Sports and games for which the materials are used
1.	
2.	
3.	
4.	
5.	

10. Names of schools with which this school has played matches and games in the last one year

Names of Schools	Matches and Games Played
1.	
2.	
3.	
4.	
5.	

11. Toilet facilities available in this school

(a) none_____

(b) palm frond/pit latrine _____

(c) flush (water system) toilet _____

This is the end of the instrument but please, go over to make sure that every item has been checked and recorded accurately.

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